THE

JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

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THOMAS GLOVER'S
PATENT DRY GAS-METERS.

LORD REDESDALE'S "SALE OF GAS ACT."

DRY METERS *VERSUS* WET METERS.

LONDON, February 25, 1861.

THOMAS GLOVER begs to call the attention of Gas Companies and others to a few *facts*, which, if duly considered, must lead to most important conclusions:—

1. That since THOMAS GLOVER commenced to manufacture his Patent Dry Gas-Meters (which is now upwards of 15 years), every Wet Meter Maker of any importance in England has been compelled to manufacture Dry Gas-Meters; and in the JOURNAL OF GAS LIGHTING, of date of 12th of February, 1861, Messrs. William Parkinson and Co., successors to the late Samuel Crossley, advertise that they "intend manufacturing *Dry* as well as" Wet Meters, and it is worthy of particular notice that they intend to do so "after 40 years experience in manufacturing Wet Gas-Meters of such a quality that has enabled them, as they say, to maintain a superiority over all other; and this, be it also particularly noticed, after they had advertised in the JOURNAL OF GAS LIGHTING, January 29, 1861, "their improved low-spouted Gas-Meter with new patent float arrangement, which entirely overcomes the difficulty experienced by ordinary Wet Meter."

2. That it is quite consistent with THOMAS GLOVER'S knowledge that Wet Gas-Meters, called "low-spouted" or "compensating Wet Meters," have already been proved to be incapable of continuous working or registration, and for this reason the manufacturers of these Meters have been induced to seek the repeal of Lord Redesdale's (righteous) Sale of Gas Act.

3. That every year the Patent Dry Gas-Meter manufactured by THOMAS GLOVER has risen in favour with Gas Companies and Gas Consumers, placing him in the proud position of being the largest manufacturer of Gas-Meters in the country.

THOMAS GLOVER guarantees his Patent Dry Gas-Meters to meet all the requirements of the "Sale of Gas Act," to give accurate and unvarying registration with steady lights; and, from their peculiar construction, cannot be tampered with, and may be fixed in open situations even above or below the level of the lights. They work with less pressure than Wet Meters, and are not affected by the most severe frost.

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MINUTE CLOCKS, PRESSURE GAUGES, PHOTOMETERS, PRESSURE REGISTERS, &c.

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NOTICES.

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THE JOURNAL OF GAS LIGHTING, WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, APRIL 22, 1862.

Notes upon Passing Events.

DR. BRADY'S Sewage Utilization Committee has continued its labours with great vigour since our last "Notes" were written, and has pretty well exhausted the scientific evidence; but so far has not examined any rent-paying witnesses of the true farmer class. Amateurs seldom know profit from loss until they retire from business. Witnesses have been called from remote parts of the kingdom, to say that they had never tried sewage as yet. Mr. Campbell and Mr. Samuel Berry Congreve, the two tenants of the Rugby Sewage Farm, who are so well known to be intelligent, and who are also so near at hand, have not been summoned. If Mr. Congreve is not summoned, it will be quite plain that Dr. Brady wants to make out a case; not to ascertain the whole truth. Before entering into a dissection of evidence which runs over almost a volume of small type, it may be well to restate what are the points on which the rate-paying public is interested. It did not require a parliamentary committee of the House of Commons to prove that liquid manure, or liquid sewage of sufficient strength, would produce great crops of grasses, both natural and artificial. That has been ascertained some hundred years ago in Lombardy, and by the experience of Edinburgh some thirty years, besides many minor examples. But a thing propounded modestly more than twenty years ago by the late Mr. Smith, of Deanston—that the profits of town-sewage would produce a surplus revenue for the use of the towns sewered, was taken up by Mr. Edwin Chadwick, the author and dictator of the first Board of Health, and converted *more suo* into a powerful engine for inducing towns to accept his tutelage, and his official engineers, and his system of sewerage, inch-pipes, telescopic-pipes, back drainage, single outfall, catch-meadow water supply, &c. To this end, well-instructed surveyors were sent about the country to prepare reports on liquid-manure irrigation, in existence or in prospect. From the reports of these well-skilled reporters, the grass-irrigating theory of Smith of Deanston was enlarged into the following axioms:—1. Liquid manure is better than any kind of solid manure; 2. Liquid manure may be profitably applied to all crops; 3. Sewage manure is the best kind of liquid manure; 4. With a supply of sewage manure, the farmer may dispense with both farm-yard solid, and guano, and all other portable dry manures; 5. Therefore, farmers (when converted from their stupidity) can afford to pay 2d a ton for sewage, in addition to the expenses of sub-piping their lands and distributing through hose; 6. Twopence a ton will yield a splendid income to towns sewered and watered under the direction of the Board of Health. Q. E. D. These axioms, supported by a large amount of evidence, selected, cooked, and garbled, in Board of Health fashion, were printed as reports in Blue Books, and circulated by thousands at the public expense. Amateur farmers in various parts of the country were seduced into substituting liquid manure, and all its accompanying expenses, for solid manure. They farmed brilliantly, were quoted as examples of progress in Mr. Chadwick's organs, but one by one retired—ruined and disgusted. The Board of Health was driven into obscurity by its failures, both as an adviser and as an executor of works, and real farmers became convinced that, although liquid manure might be a valuable auxiliary where green crops could be quickly consumed, yet that in this climate, solid manure was the foundation of profitable agriculture. There is no doubt but that the sewage of towns is a nuisance; which the Board of Health engineers disposed of, when they found farmers would not embark in sewage irrigation, by pouring it into the nearest river or brook. Hence fish killed, bathing spoiled, water rendered undrinkable, and residence on banks of sewage streams most unpleasant. To dispose of this nuisance in the best manner would be to pour it on land of a suitable character, that is, naturally porous or sufficiently drained, to enable it to absorb the sewage nearly as quickly as it is poured on it. On suitable land, sewage will produce, if applied in sufficient quantities, great crops of natural grass, and still greater crops of such artificials as Italian rye-grass. These grasses will be available for green food for live-stock, especially for milch cows, and for short periods for butcher's feed on accommodation land. Sheep would, if long kept on such land, be liable to rot; and it is doubtful whether it would be profitable food for first-class meat. Theoretically, there would be a great deal of grass for hay; practically, there are difficulties in the way of drying heavy irrigated grass crops. As town-sewage must be taken every day of the year, and cannot be stored for dry weather, it is useless to calculate on its profitable use on arable land, because there are so many times and seasons when liquid sewage would seriously injure an arable crop. But the inevitable expenses of applying liquid sewage are so considerable, and the use on the *whole* acreage of a farm so limited, that farmers near large towns, who are generally doing pretty well with the solid manure they get in their return carts and waggons, after selling their crops at market, decline to enter into a new speculation, and rent liquid sewage. Under these circumstances, the obvious course for towns troubled with sewage is to convey it by aqueducts, pipes, or carriers, to some spot of land where it

must do good, and can be no nuisance, providing always for the time when farmers may be inclined to pay any sum, however small, for irrigation purposes. In dry seasons, for many crops, especially for transplanting roots and cabbages, for washing fields immediately after grass-cutting, a flood of liquid sewage would be well worth 2d. a ton, and more than 2d.; but 2d. a ton when you want it, and 2d. a ton all the year round, or even a farthing a ton, would make all the difference between profit and loss. The great difficulty of coming to any useful conclusion lies in the exaggerated notions of the permanent value of sewage, propounded by Edwin Chadwick, and his school, headed by Mr. Alderman Mechi, and revived by Alnaschar Ellis. The evidence of Professors Lawes and Way completely dispels the 2d. a ton vision.

The Earl of Essex has addressed a letter to us, in consequence of our comments on his evidence, which we give elsewhere, and with which we have not a fault to find. It is candid and instructive; shows how thoroughly untrustworthy are the Blue-Book instructions on the use of liquid manure; and how absurd it is to estimate the saleable value of sewage at the prices glibly quoted by parties less informed and less candid than his lordship. But, we must repeat that Lord Essex's single wheat experiment is not only contrary to experience in other places, and of as little value as any single experiment, but of no value in supporting Mr. Chadwick's theory that liquid sewage is a profitable manure for wheat crops. Lord Essex may be, as we have before observed, quite satisfied with his position. He has turned the sewage of Watford from a nuisance into a producer of fine grass crops. But we cannot accept his little model-farm experiment as evidence that the sewage of London can at present be made to yield a profit rent to the Metropolitan Board of Works.

Mr. J. B. Lawes comes first in the list of scientific witnesses. He has a deservedly high position in the agricultural world, as the first who manufactured superphosphate on a large scale. He is a landed squire; one of the council of the Royal Agricultural Society; author of a number of most valuable essays on practical points of agricultural chemistry, and has carried on experiments for a series of years on a considerable scale on his Hertfordshire estate, to ascertain the comparative merits of different manures; he is also one of the royal commissioners on the utilization of sewage. The first part of his evidence showed the necessity of large applications of sewage to produce paying crops. Exact experiments at Rugby, commenced in March, and continued to October, gave the following results:—

	Tons.	Cwt.
1500 tons of sewage per acre gave of grass	15	6
1900 " " "	14	6
3000 " " "	22	15
4700 " " "	26	13
4800 " " "	27	1
6700 " " "	32	17

The land was irrigated in open channels, after the Edinburgh system. The pipe-and-hose system seems generally abandoned. The green grass was cut off to feed cattle.

The following is a summary of Mr. Lawes' opinions:—"Sewage, diluted as it is with so much water, is unfit to use with farm-yard manure. . . . We have too much water on the land already. . . . Sewage is not applicable to corn, as it cannot be used all the year round. . . . The great difficulty of applying sewage to roots is that, during a great portion of the year, you cannot put it on the land." His estimate of the produce of sewaged land is, that it is good for feeding milch cows in stalls, but not for feeding stock. It would not answer well for feeding cattle on the land. "Six shillings is the value of the constituents in the sewage of each individual, but the value delivered on the land would be from 1s. to 2s. About £1000 a year is the (theoretical) value of the sewage of 10,000 inhabitants. . . . The enormous dilution, and the application at unseasonable times, reduce the value from 6s. to 2s. or 1s. per head. . . . Sewage does not permanently improve land; it is worked out in about two years. . . . I should not like to say that sewage, as it flows over the earth, is not innocuous until absorbed. In the Essex marshes, I think it would be difficult to get it to flow; and I do not see how it could be applied to a very large extent of flat land."

Professor Hofmann does not profess to know anything practically of agriculture; therefore, his evidence may be passed over. Professor Way was long consulting chemist to the Royal Agricultural Society, and author of experiments which proved the strong affinity which clay-land has for ammonia; he was also one of the Sewage Commissioners. He shows that grass is the only crop that will pay for sewage distribution—that, on grass-land adjacent to the town, it might pay; if it had to be pumped up to hills, as at Brighton, it would not be likely to pay. "*If you were to offer me £70 worth of guano in a liquid state, I would not give £12 per ton for it, because I should have to deal with the quantity of water, which would be only an encumbrance.* . . . It might so happen that the cost of putting on sewage might render it more expensive for use, even if the pipes were laid on the land, than the employment of a similar amount of dry manure bought in the shape of guano. A farmer, if he puts on 2 cwt. of phosphate of lime to grow roots, knows that he will get so much increase in his crop; but here you introduce a new element—water—which throws all previous calculations on one side. . . . The problem to solve, with regard to town-sewage, is how to dispose, day by day, of a large quantity of liquid, which will not admit of accumulation. There are three months when you want to keep the wheat-crop as dry as possible; you could not apply sewage then. . . . The value of the matters in the sewage is very great; but it is their liquid condition which enormously diminishes their value. . . . In the abstract, sewage is goods for crops at any time; but there are cases in which, if you were compelled to take all the liquid which falls for agricultural purposes, you would undo all the good which the sewage as such would afford."

Mr. Alderman Mechi's evidence was less amusing, and quite as worthless, from want of exactness, as his ordinary agricultural statements. He repeats himself again and again. For instance, he gives his old and favourite comparison of the manurial value of human beings and sheep—a transparent fallacy. The great value of sheep is not in the special value of their manure, but that they distribute it without cost. Coke, of Holkham, said that, before Bakewell's time, sheep were valued in Norfolk as "walking dung-carts, that gave a little wool." Dilute sheep's dung with tons of water, to be carried five miles to a farm, and what would it be worth, then? Then the alderman dilates on the value of water when you want it. But how about when you do not want it? All the alderman's statistics are fallacious. He proposes to pay £16. 15s. to get an increase of six tons of hay at £4 per ton, or £24; but, warned by an old cross-examination, at a Tiptree feast, on this subject, he adds: "It would not be safe to calculate on making this large quantity unless on separate ground." Mr. Mechi, who is not a chemist, differs from Professor Lawes, and thinks the stone dust of the London streets of great value in the sewage, 'rich in alkalies'"—a piece of nonsense. Some years ago, Mr. Mechi pretended to grow his crops without solid or artificial manure—at least, his many agricultural speeches and letters dwelt only on liquid, and altogether ignored solid manure. About that time, the Highland Society gave a gold medal for an essay proving that liquid manure might supersede all solid manure. But, when Mr. Mechi came to be tackled in earnest before a farming audience, he was obliged to own that his attempts to liquefy all his manure had failed. For instance, the following extracts from a discussion at the Central Farmers Club in February, 1860, will show how carefully the statements of Mr. Mechi and his friends must be examined before they are received as evidence. Mr. Sidney said that, "in 1853, Mr. Chadwick had written to the Home Secretary, stating that ten towns were about to use sewage irrigation; and that, in 1856, a paper, read under Mr. Chadwick's auspices at the Free Trade Congress at Brussels, insinuated that a hundred towns in England were about to derive revenue from sewage irrigation, and Mr. Mechi and Mr. Walker, the attorney of Rugby, were held out as the leaders of agricultural progress in England! In 1857, Mr. Chadwick wrote a letter to the *Journal of the Society of Arts*, containing a statement, which, if true, would have made the fortunes of all who used sewage manure—namely: '*Three years increasing corn crops by the use of sewage alone; last year*, at the rate of fifty bushels an acre at Rugby.' '*At Mr. Mechi's and the new liquefied manure farms in England, the yield has been almost invariably one quarter heavier than the highest obtained by the ordinary culture!*' Having read that, he put himself in a railway train, and made a second visit to Mr. Berry Congreve, the occupier of the farm referred to (the brother of the Mr. Congreve who was present in the room). That gentleman told him that he had never had more than 10 acres of wheat under the system at all; that the application of sewage manure was a mere experiment,

and had been a total failure, the result being less every year." Again:—"In a debate at our Farmer's Club, April, 1856, Mr. Nesbit, the agricultural chemist, said: 'I recollect, some years ago, being down at Mr. Hutley's farm, in Essex, and perceiving that, without science, Mr. Hutley completely thrashed my friend Mechi, with science.' Mr. Hutley applied 15 or 20 loads per acre of farm-yard dung in the autumn, and ploughed the land five or six times. In the spring, before sowing, he applied 3 cwt. of guano, 4 cwt. of salt, and some rape-cake, and drilled the mangel seed with a little superphosphate. The result was 40 tons per acre on Mr. Hutley's farm, whereas Mr. Mechi averaged only about 13 tons. Mr. Mechi has since improved." Mr. Mechi followed, with his usual good humour, never mentioned liquid manure, but said: "He concurred with Mr. Nesbit. His largest crop, 43½ tons to the acre, had been grown by 20 to 30 loads of farm-yard manure, 5 cwt. of guano, and 2 cwt. of salt to the acre; manuring the surface, then double-trenching, and again manuring the deep furrows. Such treatment paid in the growing crop, and greatly increased the after-crop." Mr. Sidney thought that they would all agree with him, that that was pretty good farming; and that, after Mr. Mechi had put on his land loads of farm-yard manure, guano, and superphosphate in such abundance, it was not quite fair to write and talk as if it was liquid manure that grew such large crops.

Professor Voelcker, of the Royal Agricultural College, Cirencester, is a man of quite a different character. Without question, he combines more practical with scientific knowledge of agriculture than any other man of his class. He says: "I believe the theoretical calculations have no practical bearing in this matter, and that results are thus sometimes arrived at which are contradicted by experience. The intrinsic value of liquid manure, so far as it is dependent upon certain saline matters, is great—perhaps not less than 2d. per ton—but the practical value is regulated by so many circumstances, that, in one place, where, for instance, there are light soils, you could dispose of a large quantity of grass, cut green for the use of cow-keepers; in another, where there is no grass-land, and you are obliged to make the grass into hay, there are practical difficulties which make it scarcely worth the trouble of applying. . . . . A ton of guano is worth £13. 10s. The solid matter in a ton of sewage is 41 ounces, worth 2d., *supposing it was extracted*, and in the same condition as guano. But 1500 tons of sewage would not produce anything like the effect of 4 cwt. of guano, because the valuable portion is diluted with so much water that the value, in many instances, is reduced to nothing." Four or five hundred tons per acre produce no result; seven or eight thousand tons produce good results. "Supposing the soil in both cases to be the same in character, I should be surprised at the result stated by Lord Essex to have taken place upon his wheat crops, by the application of 270 tons of poor sewage. It may be explained, to a certain extent, if it were applied in small quantities at a time. I have obtained quite as great a result by the application of 1 cwt. of nitrate of soda."

Mr. Till, the borough surveyor of Birmingham, explained a very rational scheme for getting rid of the sewage of that town—viz., to construct two carriers on each side of the river Tame, along which the sewage would flow by gravitation, and be let out to such farmers as chose to pay for a supply either regularly or occasionally. At present, the farmers do not come forward. The Birmingham corporation very wisely proposes to ask Parliament for power to appoint some officer, with summary powers, to settle the amount of compensation to be paid for the land, or for the easement over it. They are not prepared to place themselves at the mercy of a compensation-jury. The only farmer-witness from near Birmingham who was examined, declared that he would not pay anything for the sewage. "I would relieve the town of the nuisance, and think I met them on honourable terms by contributing to the cost of the carriers."

Mr. Stanbridge, the town-clerk of Birmingham, is a fair specimen of a sharp lawyer, and a pert, ignorant personage when he wanders away from the beaten paths of his trade. He says—"It is very difficult to teach farmers anything." At any rate, if we compare the improvements in agriculture with the improvements in law within the last ten years, the comparison is very much to the advantage of the farmers. The town-clerk has no faith in Dr. Voelcker's analysis, and thinks he can sell solid sewage for a good deal of money; but then he is also surprised that cinders absorb the smell of night-soil; so it is evident his chemical knowledge is less than elementary. He has, however, faith in the great Mr. Samuel Hughes, who, having failed to produce a millennium in gas, has now turned his attention to sewage, and has a mare's-nest as to the deterioration of irrigating rivers by "blue billy." We await his evidence with some curiosity; no doubt his conversations with Dr. Brady will be as instructive as those of his namesake of the "Rejected Addresses:"—

> At six o'clock comes Samuel Hughes
> To black my father's boots and shoes.
> I always talks to Sam!

And the modern Sam Hughes is happy to talk to any one who will listen to him, as well as to drag any go-cart, for a consideration or without one, provided he can thereby keep his name before the public!

Mr. Blackburne is, according to his statement, a scientific engineer, and an agriculturist. The term of scientific engineer is new to us, and sounds rather quackish, but, nevertheless, there are some sensible statements in Mr. Blackburn's evidence. He uses liquid manure on a farm in Kincardineshire. The Rugby sewage farms were laid out by a successful Indian attorney, Mr. Walker, to save the stream, which bounds his residence, from pollution, under the advice of Mr. Chadwick, and, we believe, of Mr. Alderman Mechi; but, it seems like all the other farms laid out under the advice of those stercoracious luminaries, to be a blunder. "At Rugby," says Mr. Blackburne, "it was originally designed to fertilize a much larger tract of land than is now found practicable; it was applied over 450 acres, which were not in a fit state to receive sewage from the hose. Nor were the grasses growing there those which were capable of yielding the largest amount of nitrogenous vegetable matter. . . . The variety of grass will make a difference of 50 per cent. . . . Italian rye-grass is the best. . . . Land should be made as level as possible. . . . I do not think that at present sewage has any saleable value. . . . Every one feels that it is a thing to be got rid of, the amount of dilution is so enormous. . . . There are many drawbacks in applying liquid manure on arable land. . . . There is wear of the hose on the uncropped ground. . . . It is difficult to arrange so as not to go on the portion manured, and, if you do, it is perfect mortar. . . . Then, in applying it to cereals, you disturb the young plants in dragging the hose, and the expense is greater because more people are required to manage it. . . I cannot put a money value on sewage, because in most towns the application is too expensive, on account of the dilution. . . . I would not mind paying a certain amount if brought to my door." It will be very expensive to bring to every farmer's door, for their doors are far apart, not like the doors of a street.

Mr. Fenton, the engineer of the Croydon Local Board, gives some really useful information. The first attempt at irrigation made there was to turn one-third of the sewage of Croydon on 15 acres of land, and the result was a frightful nuisance. During the last twelve months, the sewage has been strained of solid matter, and the liquid turned on 240 acres of land, from 20 to 50 acres being irrigated at a time: in very dry weather, 10 acres have taken 800,000 gallons in 24 hours. The board pay £4 an acre for the land, have sunk three years profit In preparing it, and let it for £5 an acre. The Italian rye-grass has been selling, during the last few days, at the rate of £8 per acre. The solid matter sells at from 1s. to 1s. 6d. per ton. "I think, *eventually*," says Mr. Fenton, "we shall be able to make a charge for the sewage, but shall be content for a series of years with what we now get, until the farmers begin to appreciate the value of it. The difficulty we have is whether the market is not limited."

These extracts give the pith of the evidence, and prove conclusively that the disposal of sewage is so surrounded by local, and engineering, and agricultural difficulties, that towns must be content for the present if they can turn it on land, instead of into rivers, without loss. Whether so economical a bulk as that of London can be disposed of on land without considerable loss, is a great question. It is to be hoped that money may be cheap next year, and that Messrs. Napier and Hope will renew their offer.

Circular to Gas Companies.

Two additional members were appointed on the select committee on the Parochial Assessments Bill, before the House of Commons adjourned for the Easter recess, to represent the railway and the manufacturing interests. The new members are Mr. Thompson, the chairman of the North-Eastern Railway Company, and Mr. C. Turner, one of the members for South Lancashire. The gas companies and the water companies are still unrepresented on the committee; it is, therefore, most important that they should not relax their efforts to protect themselves. They ought to press at once for leave to be heard by counsel and witnesses against the Bill, which, in its present form, would perpetuate and aggravate the injustice of the system of rating of which they have so long had reason to complain. In addition to those portions of the proposed measure to which we have previously directed attention, as bearing with peculiar hardship on gas companies, the Bill contains many objectionable provisions of a general character, which have been forcibly pointed out in a petition from the churchwardens and overseers of a parish near Bristol. The objections urged against the Bill in this petition are the following:—That the committee proposed to be appointed as assessors will be deficient in the local knowledge which the churchwardens and overseers of each parish possess, and, therefore, much less competent to arrive at a just and fair valuation; that the Bill proposes to take away, except in certain cases, the right of appeal to the quarter sessions against the original assessment, and that the substitution of the assessment board for the quarter sessions would not be nearly so satisfactory to the ratepayers; that the board of guardians consist of a class of men whose time is too much occupied to enable them to pay the requisite attention to the additional duties that would be imposed on them by the Bill; that the proposed board would be incompetent to decide according to law the many questions that would necessarily be brought before them, and that the consequence would be, great dissatisfaction among the ratepayers, and unnecessary expense in having the decisions of the board corrected in a superior court; that it is contrary to the principle of justice, that the same board which imposes an assessment on the ratepayers should subsequently act as judges in cases of appeal against such assessment; and, lastly, that the Bill, if passed into a law, it would give unprecedented powers to the boards appointed by its authority, and would tend to a system of centralization which is in direct opposition to the constitution of this country. These are weighty objections to the proposed measure, in addition to the special injustice it would inflict on the holders of gas property, which we have before noticed; and we trust that the voice of the country will be so strongly raised against it, as to induce the Government either to withdraw the Bill, or to make such amendments in their plan for establishing one uniform mode of rating as to prevent it from being a uniform system of injustice. It is understood that the select committee will be summoned to proceed with their deliberation on the Bill soon after the House of Commons resumes business.

We have remarked elsewhere on the *ex parte* evidence given before the select committee of the House of Commons appointed to inquire into the best means of utilizing the sewage of towns, about the pollution of the sewage of Birmingham by the gas companies, and only refer to it again to point out the strange ignorance exhibited on the part of the witnesses, respecting the value and the properties of gas "refuse." If we may credit their assertions, the Birmingham gas companies are so reckless as to throw into the sewers, and into the river, large quantities of the residual products, which, in other gas-works, are carefully stored up, and converted into money. According to these witnesses, the Birmingham gas companies watch their opportunities during thunderstorms, and in the night, to waste the ammoniacal liquor and the tar, by pouring them into the river Tame, where they add to the pollution of the stream, kill the fish, and cover the land with a black glutinous matter, that destroys vegetation. Had those sapient gentlemen attended the lecture "On the colouring matters derived from coal," delivered by Dr. Hofmann at the Royal Institution, only three days before they gave their evidence, they would have heard that the tar which they suppose the gas companies surreptitiously throw away, produces some of the most beautiful colouring substances that are used for dyes. It is, indeed, generally well known that what is called the "refuse" of a gas-work has considerable money value; and the assertion that well-regulated gas companies, as those at Birmingham unquestionably are, would knowingly discharge the residual products into the sewers, is a self-evident fallacy. One of the witnesses showed such complete ignorance of the process of the purification of gas, and of the value of materials, that he stated the companies employed "phosphate of copper" for the purpose, and then threw it away to contaminate the sewage. He produced a specimen of this supposed phosphate of copper, which was, no doubt, oxide of iron. The absurdity of such assertions is so gross that they scarcely require contradiction; but we understand that the Birmingham gas companies are prepared with evidence to rebut the accusations.

Mr. Paynter, the magistrate of the Westminster police-court, has given a decision in a case where a person was summoned for the non-payment of arrears of gas-rate, which is so clearly wrong that we regret measures were not immediately taken to procure its revision by a superior court, as provided for by the Act passed in 1857 "to improve the administration of the law so far as respects summary proceedings before justices of the peace." In the case in question, the consumer was summoned by the Equitable Gas Company; and he claimed as a set-off against the demand the amount of a deposit made at the time the gas was laid on, with interest on that amount. Mr. Paynter, on referring to the 16th section of the Metropolis Gas Act, admitted the consumer's claim, and deducted the interest, at the rate of 5 per cent., to the day of hearing, though the company's demand for gas consumed was only to Michaelmas last. This decision must have been made on a hasty perusal of the Act, for it seems very clear that the 16th section, which allows interest on deposits, is to be taken in connexion with the two preceding sections, which render the supply of gas compulsory, and give security to the companies, who are compelled to supply gas to any occupiers of premises within fifty yards of their mains. Interest cannot be rightfully claimed on any money deposited as security before the passing of the Act. In the case in question, the money deposit was made before the Act came into operation, and the consumer was not, therefore, entitled to the advantage which it confers on those who were subsequently required to give security. The proper course for the consumer to have adopted was, to have demanded the repayment of the deposit when the supply of gas was compulsory, and he might then have renewed the security if the company required it. The Metropolis Gas Act declares the determination of the magistrates in such cases is final, but a provision of that kind in a local Act cannot override the stipulations of a general Act of Parliament, passed expressly to provide "for obtaining the opinion of a superior court on questions of law which arise in the exercise of summary jurisdiction by justices of the peace," by the authority of any law "now in force or hereafter to be made." It is expressly stated in the Act referred to that the word "justice or justices" shall include a magistrate of the police-courts of the metropolis, and any stipendiary magistrate. According to this Act, which seems to be but little known, either party may apply in writing to the justice within three days after his decision has been given, to state and sign a case setting forth the facts and the grounds of such decision. We notice the case lest it should be attempted to be used as a precedent, and to put the metropolitan companies on their guard should they have occasion to take similar proceedings.

The very efficient and business-like manner in which the justices of the City of London have proceeded to put the Sale of Gas Act into operation within their jurisdiction, is producing its expected results. It appears from a report made to the magistrates at the City of London Quarter Sessions, on the 12th instant, that, since the inspector's office was opened, on the 12th of August last, up to the 5th of April, no fewer than 39,818 meters have been tested and stamped there, and that the fees amouned to £1245. 15s., of which the sum of £537. 19s. 6d. had been received since the 28th of December last. The Metropolitan Board, on the other hand, have so disgusted the trade by their unbusinesslike and dilatory proceedings, that comparatively few meters are taken to their inspectors, some of whom have nothing to do. The number of meters stamped by the four inspectors appointed by the Metropolitan Board from the 9th of November to the 25th of March, amounted to about 10,000, and the fees received to £325. Thus, it appears that the total amount received by the four inspectors since they commenced operations has not been

equal to two-thirds of the fees received by the one inspector in the City during the present year. At this rate, the operation of the Sale of Gas Act will be a heavy charge to the rate-payers outside the City, and they will not be in a mood to admire the archictectural beauties of the palatial structures which the Metropolitan Board have decided to erect for the location of their inspectors. The more humble but efficient office of the City inspector may be more beautiful in their eyes than those costly halls to be prepared under the well-paid direction and superintendence of Mr. Cresy. In the City, the fees received far exceed the expenditure, and they might safely be reduced to one half the maximum rate allowed by the Act. In that case, the disproportion in the numbers stamped would be increased, and only such meters as the City inspector was unable to test would find their way to the meter-inspecting palaces of the Metropolitan Board of Works.

Very serious damage and fatal injuries were occasioned by an explosion of gas, on Wednesday afternoon last, under circumstances previously unheard of. The London Gas Company were laying a twelve-inch main by the side of the foot-pavement in High Holborn, and the plan adopted in doing so was to add separate lengths, about fifty yards long, to the main already charged with gas. The end of the charged main was bladdered until the length joined to it was drilled and tapped, and the requisite service-pipes connected. In this manner the workmen had proceeded safely until they arrived opposite the premises of Mr. Hulett. An additional length had been joined to the charged main, and a hole had been drilled and tapped, and the tap removed, leaving the hole open. As the end of the charged main was bladdered, it was supposed there could be no escape of gas; but there must have been either some defect in the bladder, or it was not sufficiently distended, for a quantity of gas leaked into the added length of main, the end of which had been plugged up. The gas escaping through the open hole was ignited by the fire of a portable stove used by some workmen who were soldering the pipe of a water-service, and a terriffic explosion took place within the main, the farther end of which burst like a bomb-shell, and large fragments of it were forced, with great violence, in all directions. Two of the workmen were killed; several others were wounded; the front of the stationer's shop, at the corner of Featherstone Buildings, was completely destroyed, and the upper windows were shattered. Some damage was also done to the adjoining premises; but the effects of the explosion were principally confined to one house. It is very remarkable that it was only the farther end of the new main that was burst asunder; the parts nearer to the junction with the charged main not having been injured. It appears from this circumstance that the gas must have leaked very freely into the added length of main, and that the proportion of gas to atmospheric air near the junction was too great to be violently explosive; whilst, at the further end, where there was a less proportion of gas, it had combined with the air to form an explosive mixture of the greatest force. We notice the accident thus prominently as an instance of the extraordinary risks to which gas companies are liable in carrying on their operations; and as a caution against placing too much reliance on the efficiency of bladdering in mains of large diameter. The London Gas Company accepted their responsibility without hesitation, and at once offered to make ample compensation to all persons whose property had been injured by the explosion.

We have inserted, in other parts of our present number, two communications from Mr. Rutter, on the supply of gas to street-lamps—one of them containing general observations on the subject, and the other being a reply to Mr. Anderson in reference to the Worthing award. The main point to which Mr. Rutter's observations are directed is to prove the great advantage that would result from supplying gas to all street-lamps by meter; and he contends that, in the absence of meters to each lamp, the system of averages—by which the quantity consumed by all the lamps is estimated by the measured quantities supplied to a few—is far preferable to the contract system. He replies to the objections urged by Mr. Anderson—to the effect that the resistance offered by the meters prevents the same quantity of gas from passing to the burners—by observing that the lamplighters adjust the taps to produce the same sized flame, and that, with equal flames, the quantity of gas consumed is the same in a metered lamp as in one that is directly connected with the main. Assuming the flames to be equal, Mr. Rutter is right; but so much is, in such cases, left in the power of the lamplighter, that, unless the local authorities, in whose hands he would intrust the lighting and extinguishing, be on amicable terms with the gas company, such an arrangement may give rise to endless disputes. To that part of the Worthing award which fixes the price of gas supplied to the public lamps at a much lower rate than the charge to private consumers—and to which point our objections to the award were mainly directed—Mr. Rutter gives no satisfactory reply. We cannot perceive the distinction he draws between the price of gas supplied by contract and by measure, for, in the former case as in the latter, the agreement is based on an estimated quantity of gas consumed. The expense and loss, which were clearly pointed out by Mr. Anderson, of a separate service to each lamp, with its accompanying risk of leakage, and the maintenance of a pressure in the mains at a time when no other lights are burning, are sufficient to counterbalance the advantage of having only one substantial paymaster for all. The question, as regards the Worthing award, has been fully discussed, and must now be brought to a close. If the gas company are satisfied, that is the best answer that can be given by Mr. Rutter to any imputation that he neglected their interests.

The appeal of the Liverpool United Gas Company against a judgment of Vice-Chancellor Sir W. Page Wood, granting an injunction to restrain them from the use of "bog-iron ore"—a native oxide of iron—in purifying gas, on the ground of its being an infringement of Mr. Hills's patent, has been heard by the Lord Chancellor, who expressed an opinion that the injunction in its present form could not stand, as it was founded upon a misapprehension of the plaintiff's patent, but whether another injunction having the same effect ought to be substituted was a question for grave consideration. He had no hesitation, therefore, in dissolving the injunction, and suggested to counsel in his reply to direct his arguments to what was the meaning intended by the plaintiff in the phraseology of his specification, and also whether it was within human power, and within the scope of human testimony, to predicate of the material used by the defendants, that it was a "precipitated oxide" within the meaning of the plaintiff's patent. A third point also arose, whether, by the revivifying process used by the defendants, a "hydrated oxide" was not formed within the meaning of that term as described in the specification of the plaintiff, and therefore amounted to an infringement of his letters patent. The arguments of the defendants counsel in reply were, therefore, directed especially to the points upon which the Lord Chancellor required to be enlightened, and, should he ultimately decide in favour of the defendants, another striking instance will be presented of the uncertainty of patent law, and the necessity for the appointment of some tribunal for the speedy and economical settlement of such questions.

The scheme of taxation proposed by the Government at Washington for meeting the costs of the war with the Southern States, and for payment of the interest on the debt incurred, comprises a tax on gas, equal to 1s. per 1000 feet, from which it is expected to raise £200,000 per annum. In the present debased condition of the American press, no remonstrance is raised against this imposition of a tax on light, and our contemporary even boasts that "the committee of ways and means have done us the honour to consult the *American Gaslight Journal* in forming the basis of their action." In accordance with the subservient spirit that now pervades what professes to be the organs of public opinion, the same journal "decidedly thinks that gas should be taxed as well as other luxuries." It has been, hitherto, customary to consider gas a necessary of life, and not a luxury. It is still so regarded in this country, and, if it were proposed to tax gas, there would be an outcry against it from one end of the kingdom to the other. Gas has not, indeed, been overlooked by our Chancellors of the Exchequer as a possible object of taxation, but the financial pressure must be great, indeed, to induce the making of such an attempt. The tax is regarded by our contemporary in America as an impost on the companies only, and he ventures to propose that there should be a discriminating duty apportioned to the rate of dividends of each; but taxes on articles of consumption are always paid by the consumers, and the effect of such a tax cannot fail to be a serious check to the progress of gas lighting in the North American States.

Communicated Article.

[*The publication of the third portion of Mr. Alfred Kitt's "Remarks on the Management of Clay Retorts," is unavoidably postponed till the issue of the next number.*]

GAS TO STREET-LAMPS:

CONTRACTS—AVERAGES—METERS.

By J. O. N. Rutter.

By the inquiries which are made, I learn that the present arrangements for supplying gas to street-lamps are only imperfectly understood. There is no question about the dissatisfaction which exists. Almost every one who takes any interest in the matter has a complaint, or a doubt, or an objection, or a difficulty. It is a favourable opportunity for stirring the subject to its lowest depths. If there be anything good, let it have a chance of coming to the surface. If the issue should be that a little good is mixed up with a great deal that is objectionable, it will be better to know, and acknowledge it, than go on as we have so long been going.

It is the more necessary that the sale of gas for street-lamps should be carefully examined, and its various phases explained, because a fallacy has just been imported into the discussion—a fallacy which cannot be too quickly exposed, so that the (groundless) fears it has awakened may be as quickly dispelled.

It will be seen that the fallacy referred to are some recently-published experiments with what are called "metered" and "unmetered" lights.* These experiments, varying among themselves, and necessarily so because the conditions varied, serve to illustrate a common and well-known principle; but they have no special application to supplying gas by averages, any more than they have to supplying it by contracts. They teach us no more than we knew before, namely, that the greater the pressure, the more rapidly does gas flow through any given-sized aperture. This law is known to, and must be recognized by, every lamplighter in the kingdom. It may not be understood, but it must be acted upon; and with the same amount of caution, whether the gas be paid for at a contract price per lamp, or at per 1000 feet by meter averages.

What is the every-day practice in regulating, what is supposed to be, the proper quantities of gas to the burners in street-lamps? Does it not consist in adjusting each tap in such a way that the gas admitted to the burner shall be, as nearly as can be judged, the quantity agreed upon in the contract? In making these adjustments have not the lamplighters, in their respective districts, to take into account the situations of the lamps, whether upon high-pressure or low-pressure mains; whether near to, or distant from, the works; whether on low, or high ground; and whether the fittings, taps, and burners are in good, middling, or bad condiiion? But this is not all.

What is it a lamplighter has to do? Is he to permit a specified quantity of gas, say, 4, 4½ or 5 cubic feet per hour, as the case may be, to pass to each burner? This is supposed to be his duty, and, as well as he can, he performs it. What does he know about cubic feet per hour? How does he ascertain the exact quantity? In practice, the size and shape of the gas-flame are his sole standard.

There are some other conditions which have to be considered. The lamps are lighted at high, and put out at low, pressures. That must be something more than an ordinarily clever lamplighter who by his hand, his eye, and about two seconds of observation, can do what would sorely puzzle his master, were he assisted by suitable instruments.

What is shown by the experiments just now referred to? Is it not exactly what occurs every night with street-lamps—variable pressures, failing proper adjustments, producing variable rates of consumption? And yet, although the system of thus supplying gas has been again and again condemned, and is acknowledged to be the most uncertain and unsatisfactory that could have been invented, there are persons who advocate its claims, and prefer it to every other. At sunset, a gas-flame has to be adjusted with, say, 15/10ths, 20/10ths, or 25/10ths pressure in the mains. Can that be done in such a way that no material alteration shall take place between sunset and sunrise, when the pressure is, say, 6/10ths, or 7/10ths, or 8/10ths?

Such are a few among the principal conditions attendant upon the contract system. Whatever may be the difficulties, or the objections, there is no desire, nor any intention, to magnify them. Only let them be looked at fairly; no good will come either by exaggeration or concealment. In practice, as might be expected after so many years, the objections seem to be not so great as they appear to be in theory. We get used to inconveniences, and we cling to old habits and absurd customs, because we dislike changes. Circumstances differ so greatly, that what is applicable to one locality is not to another. Lamps in exposed situations on the sea-coast, at greater elevations or lower levels than the works, require special management. If the sellers and buyers of gas for street-lamps are satisfied with the bargains they make, and everything goes on smoothly and harmoniously, the lookers-on, of course, have no right to interfere.

* Journal of Gas Lighting, March 11, 1862, pp. 145. 146, and March 25th p. 174.

As to rates of consumption, I have my experiences; other persons have theirs. Those who are able to conform to the terms of their respective contracts, and without exceeding the stipulated quantities of gas, should consider themselves fortunate. Just as we would shrink from deceiving others, let us be careful not to deceive ourselves. Not many months ago, the manager of one of the most successful of the metropolitan stations was asked, "What is your leakage?" His reply was, "That depends upon what is allowed for street-lamps." Was it not a sensible reply?

Now, let us turn to the system of supplying gas to street-lamps at a specified charge per 1000 cubic feet—the lamps being lighted, put out, cleaned, and, in all other respects, managed by the servants of the contracting authorities. In these cases, a certain number of test-lamps are mutually agreed upon—the situations selected being such as are considered fairly to represent mean averages of distances, and inequalities in levels—and a meter is attached to each lamp. The number of test-lamps may be 1 in 10, 1 in 15, 1 in 20, or any greater or less proportional number as may be thought desirable. The rate of consumption is, of course, under the control, and subject to the choice, of the local authorities. Just as happens with contract burners, the adjustments have to be made at each lamp separately. The size and shape of the flame in each of the metered lamps are taken as a standard for all the unmetered lamps; and, as far as it is possible, the lamplighter accomplishes it. The lamps are inspected by an officer of the gas company, and by one appointed by the contractors, who confer with each other as often as it is necessary.

Wherein does the plan here described differ from the old contract system? Chiefly, because the charge for gas is made according to a known and acknowledged standard (per 1000 cubic feet), and the price is definite and intelligible. The lamps, being under the control of the authorities, the times of lighting and putting out, and rate of consumption, are settled by them.

What about "metered" as compared with "unmetered" lamps? As the meter presents a certain amount of resistance to the passage of the gas, must there not, *necessarily*, be a greater rate of consumption in the unmetered than in the metered lamps? Certainly not. How is it to be prevented? Exactly in the same way that the rates of consumption in lamps, upon high-pressure mains, or at great elevations, under the contract system, are equalized and controlled—that is, by adjustments at the taps.

What are the conditions by the average system? That the same quantities of gas shall be admitted to each burner, or, in other words, that the gas-flames in the metered and unmetered lamps shall be all of the same size. How is this to be done? By the eyes, and hands, and judgment of the lamplighter. He finds out very quickly, even though he may know nothing, in the philosophical sense, about pressure, or rates of consumption, or illuminating power, that a certain turn of the tap on an unmetered lamp will give a larger flame than on a metered lamp, or *vice versâ*—and he regulates the taps accordingly.

The fallacy previously mentioned, and which has been attempted to be made an objection to the system of charging by averages, consists in passing over the adjustments at the taps. What are the taps for but to equalize pressures to the burners? Is it the common practice to set the taps full on to all the lamps, and trust to the burners to equalize and regulate the rates of consumption?

From what has been said, let it not be supposed that I think the system of averages to be right in principle. It has too much of the old error in it to be viewed as anything more than an expedient; but it may be accepted as a small instalment towards something better. It points in the right direction, but does not go far enough. Nothing could be easier than to revive all the complaints and contentions of the contract system, only changing sides with the complainants; and to do great injustice to gas companies, through the negligence, carelessness, or obstinacy of lamplighters.

In practice there have hitherto been no serious complaints, and no difficulties worth mentioning. There need not be. A mutual desire to do right never misses its object. The system of averages has worked well for several years, and, under judicious management, I know of no reasons why it may not be more generally adopted. It is deserving of notice, that where gas is thus paid for, at per 1000, the consumption is less than any of the usual stipulated rates under the contract system. This is what might be expected. It is a touch of human nature, and cannot be otherwise. When the company found gas, the streets were never properly lighted—the supply was not sufficient, the lamps were not lighted soon enough, and they were put out too soon! When the authorities find gas, and know what they have to pay for it, the lights are good, perfectly satisfactory—the rate of consumption being less by 1 to 1½ cubic feet per hour! There is not much difficulty in understanding and explaining this.

After all that has been said, there yet remains the constantly-recurring objection, which to many persons seems too horrible to be mentioned: I mean lighting and putting out the lamps by the servants of the local authorities. If that difficulty could be got over, perhaps things might go on pleasantly. Well, all that can be said is, that the plan has been tried; and, after a few explanations, and a little experience on both sides, it has worked well. Like many other things, it is not so ugly, nor so offensive, when examined closely, as it appeared to be when at a distance. Let me

ask, if the servants of the local authorities are not to be intrusted with lighting and putting out, who are qualified to do so?

There remains one other method of supplying gas to street-lamps, namely, by meters; that is, by meters wholly and exclusively. Here we get upon solid ground. Here we have to deal with a principle, not an expedient; a reality not a sham. Let all gas be sold only by measure. And why not? Why should there be one system of charges for public authorities, and another for all other classes of consumers? Was ever such a thing heard of, in any other business but gas-making, that the best customers paid the highest prices, and the worst customers the lowest? Is there any custom of trade which justifies such a distinction, the article sold to each class of customers being of precisely the same quality? This is not the worst that might be said. The prices charged for gas to street-lamps are indefinite, uncertain, and frequently changing. Is this the way that merchants, manufacturers, and general traders, manage their affairs?

Why should not public authorities purchase gas, and pay a fixed price for it, in the same way as private consumers? "Oh, there are many objections to supplying street-lamps by meters." No doubt of it; but, whatever they are, they will bear no comparison to the objections formerly made to the use of meters for private consumers. Those have long ago been silenced, and so may the few remnants of the so-called objections which have outlived them.

It would be waste of time to try to answer objections. Let us go deeper, and look at what are called difficulties. If these can be got over, the objections may be left without any fear of consequences.

Do any real difficulties stand in the way of supplying street-lamps through meters? None which deserve the name. Only admit that the principle is the right one, and go to work with a determination that it shall be fairly dealt with, and everything will come to its place, and cause less trouble than might be expected. In practice, it will soon be found which is best—a separate meter for each lamp, or one meter for every three or four lamps, according to distances. As to the situations for the meters, and the method of fitting them up, nothing is easier: a small cast-iron box, sunk to the level of the road or pavement, and protected by an over-lapping cover, is found to answer perfectly. When new columns are required, they could be made so as to contain the meters. The kind of meter, wet or dry, is of no consequence. Both have been tried, and are working well; being less affected by the extremes of temperature than many of the meters in shops and dwelling-houses. A good dry-meter possesses special advantages for out-door work; and, when it is wanted, there will be no difficulty in obtaining it.

By whom should meters be provided—gas companies or public authorities? It would be no very serious affair, whichever way it may be decided. Supposing the meters to be found by the companies, and the costs of fitting them up, and protecting them, borne by the authorities, would that be very unreasonable—the cost of meters, and of repairs and renewals, being covered by a rent-charge? Would not any given number of street-lamps be better customers than an equal number of small private consumers? How many hundreds of meters are there which sustain greater injury, and bring heavier charges on gas companies, by almost, or altogether, standing still during summer, than others which are constantly at work? The cost of meters would be an investment which would begin immediately to pay for itself.

It may be feared that meters to street-lamps would cause a great deal of extra labour for inspection. Not so. They would require to be well looked after; but it would soon be known that a street-lamp was a pleasant sort of a customer, occupying less time, and giving less trouble, than some of the other customers.

If street-lamps were supplied by meter, would the same quantities of gas be consumed in them as under the contract system? No. It is contrary to experience to expect it. Would that not be a loss and injury to gas companies? I think not; but exactly the reverse. They would make a larger amount of profit, at a fair price, by the smaller quantity of gas, than they did formerly by the greater.

More might be said in favour of meters for street-lamps. However great may be the disinclination to change, it is time a change was made. Let the sole control and management of lighting streets be passed over to the public authorities, on whom alone the duty properly devolves. Many benefits would ensue. After a little time, the lamps would be more numerous and better distributed, and the streets better lighted; the ratepayers would understand in what way, and how much, they paid for gas; the private consumers would no longer complain of disparity of prices, and contentions would, on that subject, for ever cease.

Black Rock, Brighton, April 8, 1862.

SOME REMARKS ON THE ESTIMATION OF THE MANURIAL VALUE OF HUMAN EXCREMENTS.

By J. B. Lawes, Esq.

It is a maxim in agriculture, that rich food produces rich manure; and, although science might take some exception to the saying, it nevertheless does express a truth, so long as its application is confined to animals fattening in the ordinary way on the farm. The mistake is, however, often made, of supposing that the same axiom applies equally well to human food. The chairman of the committee of the House of Commons, on the "Utilization of Sewage of Towns," the other day, asked Mr. Alderman Mechi whether the sewage of the City was not very rich after the 9th of November? and the answer was, "Very rich." The same witness, in answer to some questions put by Mr. Caird and Mr. Adderley, quoted a table published by myself, showing the value of the manure obtained by the consumption of one ton of various staple articles of food in ordinary use, in the feeding of farm-stock. In some cases, the estimated value of the manure was about 60 per cent., and in others only about 10 per cent. of the cost of the food; and Mr. Mechi assumed that the value of the excrementitious matters of the population of London could not be less than one-tenth of the cost of the food consumed. The fallacy of such a mode of estimation, in the case of human food, will be rendered obvious by an admittedly extreme example. I have before me the bill of fare of the dinner given at the Goldsmith's Hall on the 26th of last month, including nine sorts of fish and numberless *entrées*, and rivalling, no doubt, the celebrated 9th of November dinners. A dinner of this description would, doubtless, be washed down with wines of the rarest quality, and would probably cost not less than £3 per head. The value of the excrementitious matters of each person resulting from such a dinner would, however, not be more than about one farthing, or about 1-3000th part of the cost of the food. This, it is true, is an exaggerated instance of the disproportion between the value of human food and the manure it yields after consumption. At the same time, it is quite certain that the value of human excrements falls very far short of one-tenth of the average cost of the food consumed.

Again, Mr. Alderman Mechi estimates the manure of a human being to be equal to that of a sheep; though the dry matter in the excrements of the latter is several times, and the nitrogen about twice, as much as in those of a man, taking the average of both sexes and ages.

Richness and costliness in human food depend chiefly on delicately-flavoured non-nitrogenous compounds; and, in many cases, the cost of the food is due to processes of manufacture, by which the nitrogenous constituents of a crude vegetable or animal product are separated from the non-nitrogenous ones before the latter reach our towns for consumption—as, for instance, is the case with sugar, butter, wines, and, to some extent, with beer and spirits, also. For these reasons, it is obvious that the value of the excrements of civilized man must bear a much smaller proportion to the cost of his food than does that of the animal fed on crude vegetable products; and it is to the want of due consideration of the facts above alluded to, and of the distinctions they involve, that much of the exaggeration in the estimates of the value of the sewage of towns is to be attributed.

Rothamsted, April 19, 1862.

Correspondence.

LORD ESSEX ON THE UTILIZATION OF SEWAGE OF TOWNS.

Sir,—Your observations in your impression of yesterday, on my evidence before Dr. Brady's committee, require a few comments on my part. The whole gist of that evidence went to prove, by my own candid acknowledgment, that, as a pioneer in the matter, I had experienced the fate of all such rash persons; and, through miscalculation, mismanagement on various points, and a certain amount of misfortune—such as the destruction of my engine-house and engine by fire, shortly after its completion—the entire outlay was at least double what it ought to have been, and what it would be, had I to do the work over again, with my present experience: and, consequently, I should be enabled to put the sewage on my land at one-half of what it now costs me. For instance, with a very small original increase in the power of my engine and the size of the pipes, I should, with the same amount of labour, be able to put 100,000 gallons per day instead of 60,000. These errors of mine prove nothing against the intrinsic value of sewage manure, as an abstract question. You are pleased to value my experience more than my opinion. That experience most decidedly justifies my opinion that, if sewage can be laid on land at ½d., or even ¾d. per ton, it would amply repay any one who used it. In respect to my wheat experiment, I only made it because it had been always asserted that it was positively useless for wheat, or, at any rate, would produce bulk of straw at the expense of the grain. It was in order to test this, that I did not try it against any other manure. I wished to test its own value as against nothing, and the result was, I consider, most satisfactory: not that I should think it worth while to obtain sewage *only* for wheat, because I consider it never would pay so well on that crop as on the artificial grasses. In respect to them, what has been my experience? A return of from 40 to 50 tons per acre of the most nourishing and succulent food, by the application of sewage to the amount of from £20 to £25, reckoning the cost of the sewage at 1d. per ton. Even that gives a good profit. Diminish the cost to ½d. or ¾d., which might well have been the case, and the result would, of course, have been far more satisfactory. In regard to its application to root-crops, I said nothing indicative of an opinion that it could be used advantageously

as a substitute for farmyard or artificial manures; but there are times at which its value may be beyond calculation almost. Take, for instance, the case I gave, of having transplanted, during the most parching weather, 7 acres of mangel-wurzel, under such circumstances that, without the sewage and transplanting, I can truly aver my crop could not have been above 8 or 10 tons per acre, if so much; as it was, it averaged 47 tons per acre. I also stated that, last autumn, I planted 7 acres of rape and cabbage, under similar circumstances of dry weather, and have now a *most* excellent crop of those plants, of the greatest possible value to my ewes and lambs. I gave the land a slight dressing of blood-manure; but of what avail would that have been without the sewage, to moisten the ground sufficiently to enable me to prepare the land and plant? Every one knows that most artificial manures are worse than useless if the weather and land are dry. In conclusion, I will only repeat my well-grounded conviction that, if sewage can be put on the land at the price I have stated, it will amply repay its employer, for all and any crops.

ESSEX.

21, *Chesham Street, April* 9, 1862.

THE BRIGHTON ARTESIAN WELL.

SIR,—The success of the deep well on the Warren Farm, near Brighton, is an event of sufficient importance to merit notice in your columns. A very interesting geological problem has been solved; and a new source of supply for some of our populous towns on the south-eastern coast has been discovered; but the past experience of our municipal corporations leads me to fear that the real character of the phenomena observed in this instance may be overlooked, and that some dangerous illusions may be encouraged by the success of this (in itself) very satisfactory experiment. It is, in fact, desirable that the whole of the circumstances connected with this case should be understood by the parties who are at all likely to be engaged in similar operations.

The Brighton well has been carried successfully through the chalk, the upper green sand, and the gault, and, at the depth of 1285 feet, from the surface, the water burst in precisely as I feared it would have done. Fortunately, no fatal accident occurred; but the method adopted in sinking this well rendered such a contingency almost inevitable; and the immunity from accident was itself an accident. The lesson to be learned from this is, that, in future, boring ought to be adopted whenever the gault formation of the subcretaceous series has been traversed; and it is notorious, at the present day, that a boring of 4 feet in diameter upon M. Kind's system could be executed at a cheaper rate than the well at Brighton cost in its later portions. There was another singular mistake made in sinking this well—namely, that, instead of its being carried down vertically, it was sunk, as it were, in two stages, which were not in the same straight line; so that the difficulties of raising the materials, and of supplying air to the men at the bottom of the well, were needlessly increased. Knowing what we now know, it would be easy to sink a well in the bottom part of the town of Brighton for less than a quarter of the cost of the Warren Farm well; but in a first experiment mistakes in the mode of operation may well be excused; at any rate, the success of the work is the best answer to objections of detail.

It is said that the water now stands at the height of about 27 feet above low-water mark at Rottingdean, or still about 400 feet, in round numbers, from the surface of the ground at the Warren Farm. The mean-spring tide-range at Brighton is about 12 feet 7 inches; but as I cannot discover, in any of the ordinary geological, or Ordnance maps, the precise levels of the rivers Adur, or Ouse, at the points where they leave the lower green sand on the north of Brighton, I cannot yet connect the recorded height of the water in the well with any of the hydrographical conditions of the surface of the feeding-grounds. The observations upon the actual results of the well, hitherto published are, indeed, very unsatisfactory; for neither have the heights, the temperature, nor the yield of the well, been communicated, nor has any authoritative analysis of the water appeared. But I am inclined to believe, arguing simply from theory, that the level of the water in any well, sunk into the green sand at Brighton, would be regulated by that of the same formation at the points I have named, affected by the friction the water may be exposed to, before reaching any of these points of discharge. The temperature of the Warren Farm water, I should (also theoretically) expect to find about 73° Fahr., when in full flow, a temperature which would certainly be rather unpleasantly warm. Much has been said about the excellent quality of the water, but really it would be dangerous to reason decidedly on this subject until a constant draught upon the well shall have been established; at present, I should fear that a mere laboratory analysis would give very different results from those to be obtained from an examination of the body of the water in the well.

The most important fact proved by the result of this Brighton well is that the subcretaceous strata under the South Downs occur under very different conditions to those of the same strata on the north of the Wealden formations. There can now be no reason to doubt that such towns as Southampton, Portsmouth, Chichester, Bognor, Arundel, Little Hampton, Worthing, Shoreham, Newhaven, &c., situated on the south of the anticlinal line of the Weald (which passes through Winchester, and a little below Salisbury, to the vale of Wardour), would obtain water from a similar source, if the wells were carried deep enough. Near Brighton, the depth would range between 1100 and 800 feet below the low water-line; at Southampton and Portsmouth, it would range between 1300 and 1500 feet; but in any part of this district it would be easy to execute the *borings* required to secure a supply rising slightly above high-tide level at the rate of £2 per foot lineal in depth. The word *borings* is put in italics, because I wish it to be understood that the estimate only applies to that part of the work, and not to any tubing, or brick-steyning; in the chalk, no tubing or steyning would be required. On the north of the anticlinal line I have mentioned, I believe, however, that the uncertainty I alluded to in my paper read before the Society of Arts, with respect to the prospects of obtaining a supply below the gault, still subsists, and that the Brighton well proves nothing as to the capabilities of that district. The law now shown to hold good on the south side of the Weald must still be considered only to apply to the particular district I have mentioned. At Brighton itself, I would undertake to find a contractor who would engage to complete an 18-inch boring into the lower green sand for £1800; of course, without including steyning or engineer's charges.

A very curious question here arises, viz.—what would be the effect of establishing several wells in this formation, and what right any new comer may have to resort to the source discovered at such a cost? At present, there is no law of underground waters, and, according to recent decisions, any one would be entitled to sink a well in the lower parts of Brighton, for instance, which would perhaps seriously affect the yield of the Warren Farm well. The same thing might occur in this case which has already occurred with the lower tertiaries of the London basin, and the water-line of the original wells be so lowered as to render them practically of little value. It may be some years before this contingency may arise; but it must not be lost sight of, either by the Brighton guardians, or by those who may be tempted to follow their example.

GEORGE R. BURNELL.

14, *Lincoln's Inn Fields, April* 7, 1862.

THE WORTHING AWARD.

SIR,—Mr. Anderson's letter (April 8th, p. 216) contains nothing new, or that particularly requires a reply. I wish to show that gentleman every possible kind of respect; but I must decline his invitation to give him all the particulars relating to the Worthing award. I am not in the habit of making public all I know, either privately, or professionally, of other people's affairs. Most willingly will I be instructed by Mr. Anderson, and set right, when convinced I am wrong; but I must be led—not driven.

It is plain that Mr. Anderson advocates, and is committed to, the contract system. For many years I have opposed it. Differing in opinion as to the right principle for selling gas for street-lamps, it is not likely we should agree upon details. Averages by meters, as an off-shoot from the contract system, Mr. Anderson, of course, repudiates. Never mind. I am not going to deny its imperfections; but we soon hope to have something better.

The experiments, both Mr. Anderson's and Mr. Wells's, are a delusion. It is useless to argue about them, for they have nothing whatever to do with the practical working of the system. Irrespectively of the double taps at Worthing, the adjustments, with only a single tap, must be made previous to the gas entering the burners; and solely with reference to the sizes of the flames. The consumption in the unmetered lamps cannot be greater than in the metered lamps, if the flames are of equal sizes. What is there to prevent there being a greater quantity of gas passing a metered, than an unmetered lamp, if such a thing were permitted? If there be differences in the sizes of the flames, the only rule by which the lamplighters are guided, such differences are due to improper adjustments, not to variable pressures.

As to prices—my opinion is not altered; a separate service to each lamp, and leakage thereon, notwithstanding. It occurs to me, however, that Mr. Anderson and I are not thinking of exactly the same thing. He, probably, refers only to prices under the contract system; whilst I am intent only upon the prices of gas by meter. Nothing could be more desirable than to stand out for a price by contract, as nearly as could be estimated, equal to that paid by private consumers. It would speedily accomplish that which I am pleading for—the utter annihilation of the contract system.

The sale of gas by meter, and a fair abatement in price to public authorities, on the same principle that discounts are allowed to large consumers in the manufacturing towns, I believe to be right.* It will require a great deal more than I have yet seen, or heard, or read, to convince me that customers who purchase annually as many millions of cubic feet as small consumers do thousands, or even hundreds, ought to be charged the same prices. A street-lamp supplied by meter will be a better customer, at a reasonably lower price, than hundreds of small consumers. It is descending to clap-trap to talk about local authorities and small

* See prospectus of Gefle Gas Company, in which it is stated that the prices of gas are, 8s. 5d. per 1000 cubic feet to private consumers, and 6s. 9d. to the corporation for street lights. Here is a case of "beginning at the beginning," and with a reduction of 20 per cent.

consumers paying equal prices. Are the manufacture and sale of gas always to be excepted from the ordinary rules of trade?

If I appear to be a little too hard upon his favourite system, I ask Mr. Anderson to think of what that system has been. Many contracts still existing do not, on the most favourable estimates, yield a price per 1000 equal to one-half that now paid by private consumers; and, at the times at which the contracts were made, the price was not a third, if even a fourth, part of the then current prices by meter. These were the practices so justly condemned in the Waterford case by Mr. Richards.

I have had no communication with Mr. Wells since the award was made. The company authorized me to state that the existing contract had given satisfaction to the respective contracting parties.

Black Rock, Brighton, April 12, 1862. J. O. N. RUTTER.

Register of New Patents.

2184.—THOMAS SHUTT STOCK, and JOSEPH SHARP STOCK, and HENRY TAYLOR, all of Birmingham, Warwick, manufacturers and copartners, for "*A new or improved tap or stop-cock.*" A communication. Patent dated Sept. 2, 1861.

This invention consists of a tap or stop-cock, in which the waterway is opened and closed by a valve, which is pressed upon and lifted from its seat by means of a rod, to which rod a handle of the tap gives motion by a crank or eccentric.

2213.—FREDERICK BENNETT, of Upper Works, Bagillt, Flint, manager, for "*An improved method of coating the interior surface of lead, and lead composition pipes, with tin, or its alloys.*" Patent dated Sept. 5, 1861.

This invention relates to those lead or lead composition pipes which are manufactured by hydraulic pressure, and consists in forming the core or mandrill, over or around which the pipes are formed, hollow or tubular, and in causing the tube or hollow in the mandrill to communicate with a reservoir or supply of tin or alloy of tin, the level of which is maintained at such a point that the tin will just overflow the lid or upper end of the tubular mandrill, and the leaden tube is formed over the hollow core or mandrill; so that it receives a uniform coating on the interior of the tin or tin alloy, which is kept flowing over the lip of the mandrill.

The claim is for the improved method of coating the interior surface of lead or lead composition pipes with tin or its alloys, by means of a hollow core or mandrill, as hereinbefore described.

2120.—ROBERT WATKIN JONES, of Glenbrook Baths and Hotel, Cork, for "*Improvements in heating and ventilating, especially applicable to Turkish baths.*" Patent dated Aug. 26, 1861.

This invention relates to a mode of heating baths, especially Turkish baths, by a combination of hot air and vapour, and is also applicable for ventilating the same, whereby an abundant supply of fresh air is obtained, both pure and soft, at a well-regulated and agreeable temperature, free from the unpleasantness of an atmosphere overloaded with moisture, and also the danger of throbbing temples, quickened pulse, and exhilarated action of the heart, produced in the dry, parched air of a hot bath, or Roman bath at a high temperature.

It is proposed, by flues, passages, or air-chambers, peculiarly constructed, and arranged between the heated floor, immediately over the heating flues, and under the upper floor of the suditorium and tepidarium, to prevent accidents by burning, to which people are very liable in the hot-air bath, with horizontal flues constructed and covered in the ordinary way.

The heating-flues are connected with an ordinary furnace, over which are placed two boilers—one, the circulating-boiler for heating water, the other a steam boiler for generating steam or vapour, which is admitted into the hot rooms of the Turkish baths by a pipe, which branches off into each room, and is regulated or controlled by separate cocks, to which again are attached perforated pipes which can be arranged in such a manner that a general and equal distribution of vapour is made, and is so completely under control, that the vapour can never become disagreeable or oppressive, nor condense on the body of the bather. The hot-air flues, passages, or chambers, constructed between the two floors, are also used to obtain an equal and even distribution of heat in every part of the hot room or suditorium, and also in the tepidarium, and maintaining the required difference in the temperature of the two rooms, and further for lowering or increasing the temperature for the admission of pure oxygenized hot air for the purpose of ventilation and driving out impure air, so that the same air is not left in the room a minute, but is constantly changed, which obviates the necessity for chilling the bather by the introduction of cold air; and this pure oxygenized air is also used for dispensing with the vapour, which is only allowed to pass over the surface of the body of the bather to soften it, and assist perspiration, which perspiration, to the great danger of the bather, is forced in the dry hot-air bath.

By the use of tiles of a peculiar make, which fit into each other where they join over the different flues, the admission of gas, smoke, or any other injurious or deleterious matter, is impossible, and the air is thereby preserved pure. For retaining heat, fine sand is used.

2221.—JOHN REID, of Leith, Mid-Lothian, N.B., gas engineer, for "*Improvements in the treatment of gas, and the apparatus employed therein, with a view to its more accurate measurement in wet gas-meters.*" Provisional protection only obtained. Dated Sept. 5, 1861.

This invention relates to a system or mode of treating gas so as to prevent, as far as possible, its absorbing moisture in passing through gas-meters of the wet-class, and to the apparatus to be employed for that purpose.

Under one modification or arrangement suitable for effecting the object in view, the gas is caused to pass through a vessel which is divided by partitions, so as to cause the gas to take a circuitous route in its passage to the meter. If the vessel or saturating-chamber is of rectangular figure, which would form a suitable base for a meter, the partitions are arranged longitudinally, so that the gas passes along one channel, and round the partition into the contiguous channel, and so on throughout the series. The lower part of the partition-chamber is covered with water, which is of sufficient depth to avoid the necessity of frequent replenishing. As the gas passes over the water, it absorbs the moisture, or takes up more or less of the water according to its temperature, and its absorbing power. Its absorption is further facilitated by placing slips of linen or other textile fabrics over the edges of the partitions; and, dipping into the water, the fabric draws up the fluid by capillary attraction, and becomes saturated with water which is again taken up by the gas in its passage through the apparatus. The vessel is fitted with suitable inlet and outlet-pipes, the former of which is connected with the service-main, and the latter with the inlet-pipe of the meter.

The fluctuation of the water-level in gas-meters mainly arises from the quantity of water absorbed and carried out of the measuring-chamber of the meter by the gas in passing through, which variation gives rise to errors in the registration, and causes the stoppage of the gas. Now, by this invention, the gas is saturated with moisture before it enters the meter, and is thereby prevented from affecting the water-line level. The saturating-chamber may be of various forms, and may either be detached from the chamber or form part of it.

The essential feature of this invention is the treating of the gas so as to cause it to take up moisture, and prevent, as far as possible, its diminishing the volume of water in the measuring-chamber of the meter, so as to secure accuracy of registration by preventing or diminishing the waste of water, otherwise carried off by the gas in its passage through the meter.

2229.—CHARLES FELTON KIRKMAN, of Palace New Road, Lambeth, for "*Improvements in obtaining manure from sewage, and in the apparatus employed therein.*" Patent dated Sept. 6, 1861.

This invention consists of the employment of a series of tanks or reservoirs with other apparatus for the purpose of filtering the water of sewage, and dealing with the deposited matters.

2265.—CHARLES GREAVES, of Old Ford, Bow, Middlesex, civil engineer, for "*Improvements in apparatus for preventing waste of water from service-pipes or cisterns.*" Patent dated Sept. 12, 1861.

This invention relates to a peculiar construction and arrangement of apparatus for preventing waste of water from service-pipes and cisterns, and consists in the employment for the purpose of a closed air-vessel, which is supplied with water from any ordinary service-pipe leading from the main, and is provided with a two-way cock, which is so constructed that, when turned in one direction, it will enable the supply of water to enter the air-vessel, and partially fill the same, the air contained therein partially undergoing compression; and, when turned in another direction, it will shut off the supply entering the air-vessel, and open the outlet from such vessel, the water then issuing therefrom with a certain pressure due to gravity, and the pressure of the air in the air-vessel. By this arrangement, it is obvious that the water to be drawn off for use must come from the air-vessel, and not from the service-pipe direct; hence the liability of the water being wasted by leaving the cock open is obviated, and the contents of the air-vessel only can be run off. In place of a single two-way cock, it is evident that two separate common cocks may be employed, but the preceding arrangement is much more convenient. If it should be necessary to replace the air, which might, under some circumstances, be absorbed by the water, or escape through small imperfections in the castings or fittings, an air inlet-valve may be fitted air-tight to the upper part of the air-vessel.

The claim is for the general construction, arrangement, and combination of apparatus for preventing waste of water from service-pipes or cisterns substantially as hereinbefore described.

2287.—WILLIAM HENRY CRISPIN, of Marsh Gate Lane, Stratford, Essex, copper-smelter, for "*Improvements in the manufacture of curved and angular paper tubes and pipes.*" Provisional protection only obtained. Dated Sept. 14, 1861.

This invention relates to certain improved methods of constructing curved and angular paper tubes and pipes, whereby the difficulties and imperfections hitherto incident to the manufacture of such articles are surmounted. In order to form curved tubes and pipes or bends, as they are technically termed, the paper of which the article is to be made is, in the first instance, covered with a coating of pitch, or other bituminous material. This is conveniently and efficaciously done by reducing the pitch or other bituminous substance to a state of powder, which is sifted or distributed over the surface of the paper, the latter being exposed by means of hot metallic plates or otherwise to the action of a sufficient degree of heat to melt the pitch or bituminous substance employed. The paper thus receives a perfect and even coating of pitch or bituminous substance.

This is a simple and speedy mode of effecting the object in view, but any other method of giving the requisite coating to the paper may be employed. The paper should be cut into strips of any required width either before or after being coated.

The paper having been thus prepared, strips thereof are wound or twisted spirally around mandrills of the size and form of the tubes or pipes which it is desired to manufacture. The mandrills employed are made of metal, and may be either solid or hollow. In the latter case, heat may be imparted to the interior of the mandrill by means of hot water, steam, hot air, or any other of the known means of imparting heat under such circumstances. When solid mandrills are used, heat may be communicated to them by any suitable means.

Upon the prepared paper being wound or twisted round the mandrill, as before mentioned, the pitch, or bituminous substance, with which the former is coated is partially melted, causing the convolutions of the paper to adhere together, the compression being continued until the tube or pipe is of sufficient thickness, a coating of pitch or other bituminous substance being given from time to time as may be deemed requisite, while perfect smoothness and regularity of form may be obtained by moulding with the hand, or by means of suitable tools or appliances. The mandrills should be covered with grease, or some other substance which will prevent adhesion of the paper, and the curves employed should, in all cases, be portions of true circles, in order that the mandrills may be withdrawn without injuring the tubes or pipes. If considered requisite, greater strength and hardness may be given to the tubes or pipes by employing

external pressure during the process of manufacture, and extra layers of paper may be used at those parts which require greater strength, and, in some cases, layers of canvass or calico may be added for the like purpose.

In the manufacture of angular and junction-tubes, or pipes to be used instead of T-pieces, and otherwise, a spherical boss is formed of paper prepared, as hereinbefore described, or otherwise rendered sufficiently adhesive, the same being cut into strips of considerable length, and in the form of greatly elongated acute triangles, the strips thus formed being wound round a mandrill or spindle, beginning at the base of the triangle, and winding the same until a sufficient thickness has been obtained. The mass thus formed can be moulded into a spherical shape by compression or by other suitable means, and the mandrill or spindle then withdrawn, thus leaving a solid sphere with a tubular aperture through the same, into which a plain or straight piece of tube or pipe is afterwards fixed. In order to connect two or more pipes, at any desired angle, to each other, the boss and pipe passing through the same are bored or drilled, at the desired angle, from the external surface of the boss to the tubular aperture, the branch-pipe or pipes being inserted into the openings thus made, and then securely cemented. By these means, joints or junctions of any kind, and at any angles, and with any combinations, may be readily formed.

APPLICATIONS FOR LETTERS PATENT.

969.—John Nock, and William Kirby Price, of Birmingham, Warwickshire, gas-stove manufacturers, for "*An improvement or improvements in gas cooking-ranges.*" April 4, 1862.

1001.—Howard Ashton Holden, of Birmingham, Warwick, merchant, and Charles Weekes, of the county of the borough of Carmarthen, civil engineer, for "*Improvements in apparatus used in drawing water, or other fluids, from cisterns, tanks, or other vessels.*" April 8, 1862.

1017.—William Edward Newton, of the office for patents, 66, Chancery Lane, London, W.C., civil engineer, for "*An improved apparatus for raising and forcing water, and other liquids.*" A communication. April 9, 1862.

1021.—Daniel Fryer, of Carlton Square, Old Kent Road, London, S.E., and William James Williams, of Arundel Street, Strand, London, W.C., gentleman, for "*Improvements in the method of, and apparatus for, letting on and cutting off the supply of gas to groups or districts of street, and other lamps, from a central point or depôt.*" April 10, 1862.

1043.—William Edward Gedge, of No. 11, Wellington Street, Strand, London, W.C., patent agent, for "*An improved lamp for lighting mines.*" A communication. April 11, 1862.

1075.—Richard Archibald Brooman, of 166, Fleet Street, London, E.C., patent agent, for "*Improvements in pumps.*" A communication. April 14, 1862.

GRANTS OF PROVISIONAL PROTECTION.

17.—John Jacob Gutknecht, of Neuhof, near Fizers, Switzerland, engineer, for "*Improvements in meters for measuring gas, water, and other fluids.*" Jan. 1, 1862.

533.—Thomas Adams, of Deptford, engineer, for "*Improved arrangements for effecting an equilibrium of the steam pressure upon valves, the said arrangements being also applicable for effecting equilibrium of fluid or gaseous pressure upon other valves.*" Feb. 27, 1862.

801.—Joseph Henry Tuck, of 35, Cannon Street, London, E.C., for "*Improvements in the manufacture of flexible valves.*" March 22, 1862.

811.—Samuel Ellison Turner, of Birkenhead, Cheshire, for "*An improved apparatus for burning a mixture of inflammable gas and air.*" March 24, 1862.

819.—Echlin Molyneux, junior, of Seaview, Enniskerry, Wicklow, for "*Improvements in air, gas, and vapour-engines.*" March 25, 1862.

826.—William Palmer, of Sutton Street, Clerkenwell, London, E.C., for "*Improvements in lamps.*" March 25, 1862.

831.—John Henry Johnson, of 47, Lincoln's Inn Fields, London, W.C., and of 166, Buchanan Street, Glasgow, N.B., gentleman, for "*Improvements in apparatus for cleansing tubes and flues of steam-boilers, and similar conduits.*" A communication. March 26, 1862.

862.—James Jones, of Mersey Bank, Warrington, Lancashire, engineer, for "*Improvements in apparatus for raising and forcing liquids.*" March 28, 1862.

866.—Eugène Théodore Noualhier, of Paris, manufacturer, for "*An improved ventilator.*" March 28, 1862.

869.—Edmund Smith, of Hamburgh, gas-meter manufacturer, for "*Improvements in wet gas-meters.*" March 28, 1862.

980.—Charles Stewart Duncan, of Monmouth Road North, Bayswater, London, W., for "*An improved method of, and apparatus for, ventilating, cooling, or suppressing fire in public and private buildings or rooms.*" April 7, 1862.

1016.—John Knowelden, of Southwark, London, S.E., engineer, for "*Improvements in steam, water, and other fluid engines.*" April 9, 1862.

NOTICES TO PROCEED.

2993.—Magnus Ohren, of Sydenham, Kent, A.I.C.E., for "*An improvement in the manufacture of gas, and the apparatus connected therewith.*" Nov. 27, 1861.

3024.—Gerard Ratson, of 21, Tokenhouse Yard, London, E.C., for "*Improvements in the mode of preparing and applying a certain material on the hulls of iron or wooden ships, or on the surfaces of materials for building the same; also for preventing oxidation and tubercles in iron water-pipes.*" A communication. Dec. 2, 1861.

3048.—John Knowelden, of Southwark, London, S.E., engineer, for "*Improvements in pumps.*" Dec. 5, 1861.

3058.—John Bailey, and William Henry Bailey, both of the Albion Works, Salford, near Manchester, Lancashire, turret-clock-makers, for "*Improvements in apparatus for indicating the pressure of steam and gases, the amount of vacuum, the flow of fluids, the weight of materials, and the speed of bodies, either revolving or traversing; and, also, the employment of aluminum, or its alloys, in the manufacture of the same.*" Dec. 6, 1861.

3065.—Heinrich Gottfried Schram, of 149, Rothenburgsort, Hamburg, for "*Improvements in rotatory engines and pumps.*" A communication. Dec. 6, 1861.

3069.—Richard Jolley, of 47, St. John Street, Smithfield, London, E.C., for "*An improved apparatus for heating, cooling, or drying, infusing, extracting, or absorbing vapours or gases for manufacturing, medical, or domestic purposes, and for preserving liquids and solids, alimentary, or otherwise.*" Dec. 7, 1861.

3090.—Hector Alexander, of Glasgow, Lanark, N.B., gas-burner manufacturer, for "*Improvements in turning apparatus for making gas-burners.*" Dec. 10, 1861.

37.—Arthur Warner, of No. 31, Threadneedle Street, London, E.C., for "*Improvements in preparing materials for, and in, purifying coal-gas.*" Jan. 4, 1862.

67.—Richard Archibald Brooman, of 166, Fleet Street, London, E.C., patent agent, for "*Improvements in apparatus for carburetting and burning gas.*" A communication. Jan. 9, 1862.

289.—Thomas Mossom Meekins, LL.D., of the Inner Temple, Esq., Barrister-at-law, and of 44, Chancery Lane, London, W.C., for "*The production of a projectile and explosive force to be used in instruments of war, for an electric gas-gun and electric gas-shell, for a method of using the recoil of weapons, for the purpose of increasing the pressure of elastic fluids, for the production of a projectile force, for a method of rapidly loading weapons at the breach, and of a motive force to be used in an electric gas-engine, or other engines.*" Feb. 4, 1862.

722.—John Avery, of 26, Mark Lane, London, E.C., for "*Improvements in purifying coal.*" A communication. March 15, 1862.

727.—William Clark, of 53, Chancery Lane, London, W.C., engineer and patent agent, for "*Improvements in water-meters.*" A communication. March 17, 1862.

Parliamentary Intelligence.

HOUSE OF LORDS.

Monday, April 24, 1862.

The Heckmondwike Gas Bill was read a second time, and committed.

Tuesday, April 8.

The Bollington (Prestbury) Improvement and Lighting, and the Barnsley Local Board of Health Bills, were read a second time, and committed.

Friday, April 11.

The Reading and Reading Union Gas Company's Bill was reported, with amendments.

HOUSE OF COMMONS.

Monday, April 7, 1862.

The Bristol Water, the Caterham Water-Works, and the East London Water Bills, were read a second time, and committed.

Parochial Assessments Bill.—Petitions against the Bill were presented from the Canterbury Gas Company, the Worcester Gas Company, the Sheffield United Gas Company, the Staleybridge Gas Company, the Hartlepool Gas and Water Company, the Coventry Gas Company, the Petworth Gas Company, the Shipley Gas Company, the Northampton Gas Company; and two others.

Tuesday, April 8.

The Kent Water Bill was read a first time, and referred to the Examiners.

The Woolwich, Plumstead, and Charlton, &c., Gas Bill was reported, without amendment.

Parochial Assessments Bill.—Petitions against the Bill were presented from the Boston Gas Company, the Brentford Gas Company, the Stafford Gas Company, the Oxford Gas Company, the West Ham Gas Company, the St. Alban's Gas and Water Company; and four others.

A petition was presented against the Leeds Water Bill, from Captain Robert Gunter.

Wednesday, April 9.

Parochial Assessments Bill.—A petition was presented against the Bill.

Thursday, April 10.

Two petitions were presented against the Highways Bill.

Parochial Assessments Bill.—Petitions against the Bill were presented from the Cambridge University and Town Water Company, the Leeds New Gas Company, the Birmingham and Staffordshire Gas Company, the Bradford Gas Company, the Rossendale Union Gas Company, the Berwick and Tweedmouth Gas Company, the Woolwich Equitable Gas Company, the Gosport Gas Company, the York United Gas Company; and two others.

Friday, April 11.

Parochial Assessments Bill.—Petitions against the Bill were presented from the Wakefield Gas Company, the Wakefield Water-Works Company, the Chesterfield Water and Gas Company, the Runcorn Gas Company, the Bridgewater Gas Company, the Dewsbury and Batley Gas Company, the Pudsey Gas Company, the Huddersfield Gas Company, the Luton Gas Company, the Rotherham Gas Company; and six others.

HOUSE OF COMMONS.

UTILIZATION OF SEWAGE OF TOWNS.

[*Continued from Page* 231.]

MONDAY, APRIL 7.

Mr. *W. S. Till*, examined by Mr. ADDERLEY.

I am the borough surveyor of Birmingham. Prior to the year 1851, the town was divided into five districts, each having distinct boards of commissioners. By an Act of Parliament then obtained, they were united, and power was given to the town council to carry out a general system of drainage. The new sewers were commenced in 1852. The sewage of the town was first discharged into the river Tame in 1853. That was the beginning of the end of the cesspool system. At this moment, the contents of the sewers are discharged into tanks. I have a plan, showing the first tank constructed. It is 300 feet long, 9 feet broad, and in depth averages 7 feet. The overflow from this tank passes into a second, and from thence into a third pit. [Witness explained, by reference to a plan, the general arrangement of the apparatus employed for filtering and subsidence.] A continuous working is maintained, and the overflow from the pits runs into the river. The sewage of a population of 250,000, in round numbers, is dealt with in this way. On either side of the borough, there are populous districts, which discharge their sewage into the river. The volume of water flowing out at the outfall at Birmingham is about 12,000,000 gallons per day—that is the average in dry weather. I cannot tell the amount of cesspool-sewage which is prevented from coming into the tanks. The greater portion of the sewage of the town is still retained in cesspools and ash-pits. The solid matter contained in the 12,000,000 gallons is about 60 tons. Up to the present time, we have been simply removing this intercepted matter from the tanks, and placing it on adjacent land to dry by evaporation. We have had under consideration the propriety of drying it by means of kilns. There is plenty of demand for the solid manure from farmers in the immediate neighbourhood of the town, and within a distance of ten or twelve miles. We have been giving it away hitherto, so that they have had it for the cost of carriage. I have no doubt at all that there is a permanent demand for it within ten miles round the town, and that a low price could be easily obtained—I should think from 1s. 6d. to 2s. per ton. I have been selling it at the nominal price of 6d. per cart-load at the tanks; and it has been taken as far as Water-Horton, a distance of seven miles. A large quantity of liquid sewage, direct from the main, without passing into the river, or undergoing any process of subsidence, has been used upon meadow-land, and has given as a result enormous crops of grass. The farmer who uses it—Mr. Burbidge—put it on at the latter end of February, and he has a good crop of grass at the present time. He has had it upon a small piece, of about eight acres, for the last seven or eight years; and upon 60 acres during the last three years. We have given it him free of expense on the 60 acres, on account of the facilities he afforded us in constructing our works; and upon the 8 acres he pays at the rate of 14s. per acre per annum. It is the mixture of solid and liquid sewage as it comes out of the main. No experiment has been made with the liquid overflow from the tanks. I have repeatedly asked Mr. Burbidge to do so, but he prefers it direct from the sewers. He has used 12,000,000 gallons per day continually for one month upon the 60 acres of land. I am rather of opinion it was an excessive supply.

By the CHAIRMAN: The crops have been most luxurious—the grasses principally. He lets out his land to farmers in the district for grazing, and then shuts up the meadow for hay. There is no doubt that he can feed a larger number of cattle upon this land than upon ordinary grazing land. By ordinary grazing land, I mean land irrigated with other than sewer-water.

By Mr. ADDERLEY: The question has been canvassed in the town as to the use of the overflow from the tanks; and, lately, the town-council convened a meeting of the agriculturists in the valley of the Tame, to consider it. The proposition was, that two main-carriers should be laid, one on either side of the river, into which the sewage emerging from the pits should be conveyed, and then, by means of cross-carriers, taken on to the land. It would flow down the main-carriers by gravitation, as the whole of our sewage is delivered five or six feet above the ordinary service-pipes of the Tame. The idea was to let out the sewage to the farmers through whose land we passed; but there are great difficulties in the way, inasmuch as the land in the neighbourhood of Birmingham belongs to a large number of persons in small holdings, and nothing short of the authority of an Act of Parliament would enable us to lay down the carriers. If it could be done, I believe it would pay the expense. It was intended that the carriers should be open, except in the immediate vicinity of buildings. I do not think any additional tanks would be required, beyond those we have. I have no knowledge, from actual observation, of the comparative value of the liquid overflow and the deposit; but I believe the liquid to be much more valuable than the solid. I have seen the solid matter used on the land in the neighbourhood of the works, and also the sewage direct from the main. The latter is much the best. I have no means of telling the value of the liquid overflow. The outlay by the corporation in the construction of the tanks, and two main high-level intercepting sewers, has been between £9000 and £10,000. Birmingham lies upon two main valleys, and these sewers represent the outlet from each. Originally, the sewers were constructed at a low level, and ran direct into the river; and, instead of going to the expense of pumping, we have now constructed the two high-level sewers. In addition to the cost of these, we have spent £15,000 or £16,000 upon land. The land upon which the sewers and tank stand, cost £5000, and we paid £10,000 for additional land, in order to obtain good access to the canals, country roads, and railways, and also for the purpose of laying out the sewage to dry. Last session, we obtained authority from Parliament to borrow another £100,000, to enable us to carry out our sewerage plans. It would depend upon the farmers whether, if we obtained authority from Parliament, and extended our mains, we should continue the system of precipitation as at present carried out. If the farmers preferred it from the tank, we would give it them in that state. From my observation of the effect upon Mr. Burbidge's land, which is supplied direct from the main, I would much rather not continue the precipitating system. There would be no engineering difficulty in having both plans in operation at once. The corporation of Birmingham have had a scientific analysis of the sewage made by Dr. Voelcker. His analysis of six samples of intercepted matter, and of that which was a mixture from all three pits, was as follows:—

General Composition.

Mixed deposit kept for three months and dried at 212° Fahrenheit, had lost 47·47 of water. The dry residue on burning, gave 34·92 of ash. Accordingly, the general composition was—

Water	47·47
Organic matters	17·61
Mineral matters	34·92
	100·00

Detailed Composition of No. 3 Deposit.

100 parts contained—

Water	47·47
Organic matters	17·61
Containing Nitrogen ·41	
Equal to ammonia ·50	
Sulphuret and oxides of iron and alumina	4·02
Phosphate of lime	1·01
Sulphate of lime	·22
Carbonate of lime	·52
Carbonate of magnesia	·09
Sulphuret of copper and zinc, chiefly sulphuret of zinc	·94
Chloride of sodium	·05
Silicious matter (sand)	28·07
	100·00

I do not know whether there is any difference between the sewage of Birmingham and that of other towns. Vitriol, in large quantities, must be discharged into the sewers there; but whether it has a damaging effect upon sewage I cannot tell. Large quantities of gas refuse, also, there can be no doubt are discharged into the sewers. I have seen it repeatedly coming down into the tanks, and I have seen it, while the meadows have been under irrigation, come down on the surface of the sewage, and, if I had not told the men to turn off the sewage, the meadows would have been much damaged by it.

By the CHAIRMAN: What I saw floating down on the surface of the sewage was what in Birmingham is called "blue billy." There are large quantities of copper used in the town.

Mr. ADDERLEY: With regard to gas-water, is there no legal provision to prevent it?

Witness: It is a most unsatisfactory one, but the town-clerk will inform you better about it.

By Mr. PAGET: The proportion of water-closets in Birmingham is very small. I should think that not above one-twentieth of the houses have them. There are great difficulties in getting the contents of the cesspools removed. It costs the corporation £10,000 per annum, the net cost being about £6000. A large quantity of the contents is taken to country dépôts, and there lies in heaps; there are thousand of yards of it. The river Rea runs into our sewage before it reaches the tanks, but the proportion of water is small. I think we should have no difficulty in letting the land with the sewage on it. Applications have reached me from persons holding land below Mr. Burbidge, to obtain the sewage, and I told them they could have the free use of it for one year if Mr. Burbidge would give them the use of his carriers, but he refused. I do not consider the tanks a necessary part of the system; their use was forced upon us by an injunction from the Court of Chancery. I think the system of open carriers would be all that is required. I do not apprehend any difficulty in dealing with the sewage as it passes from the town.

By Mr. BLENCOWE: The extent of our sales of solid matter is very small, as we want to get the farmers to use it. We have sold it at 6d. per ton, which is the expense of loading the boats. Probably the receipts for it have been £7 or £8 a month. After Mr. Burbidge's land is irrigated, the overflow of water is not offensive. Judging from appearance, I should think it is quite equal to to that from the tanks, which is of a light-brown colour. There are traces of ammonia in it.

By Mr. GREGSON: The powers which we should ask from Parliament would be—power for the surveyor to determine where a carrier should be placed; and power to appoint some officer, with very summary powers, to settle the amount of compensation to be paid for the land, or for the easement over it. We should not ask power to compel a farmer to use the sewage, but to allow it to pass through his land. I think the sewage would be in general demand, and that within a very few miles of Birmingham the whole would be absorbed.

By the CHAIRMAN: The system of interception was forced upon us, by our being prohibited from allowing any solid matter to pass into the river. We were not bound to any particular kind of tank. If there were a sufficient area of land to pass the sewage over, I do not think they would be absolutely required; but in our case they might be useful, as the land is not always in a condition to take the sewage. I would not give the monopoly of its use to any one person, but would put it up to the highest bidder. I believe it is worth much more than 14s. per acre. If we had sufficient land, I do not anticipate any difficulty in getting rid of the whole of the sewage.

By Mr. GORE LANGTON: There is a large amount of silicious matter in the deposit of our sewage, arising from the character of the country, and the fact that all our roads are macadamized.

Mr. *Richard Fowler*, examined by Mr. ADDERLEY.

I am a land-agent and valuer, and the occupier of land in the neighbourhood of Birmingham. I began to farm the land which I now occupy in 1840. It is distant from 2 to 2½ miles from the tanks; and I took it from a conviction that the irrigation might be greatly improved, and that the land would increase in value. I occupy about 60 acres, 9 of which were irrigated when I first took them, chiefly by flood-waters. I extended my system of irrigation in 1852 and 1853, and have since used the Tame water, with sewage running into it, for the purpose, upon the whole 60 acres. I expended £9. 10s. an acre upon it, and find the result beneficial. I have my stock from two to three weeks earlier than formerly; and I have a great increase in the bulk and weight of my grass crops for hay, although the hay is not so valuable per ton. Some portion of my land is not sufficiently good for hay crops. I consider my spring feed is worth more. For the purpose of irrigation, I think the river is not more valuable now than it was twenty years ago.

Mr. ADDERLEY: Then, your opinion is, that irrigation with a large quantity of water produces as much effect upon grass as to irrigate with the river Tame, with all the sewage running into it?

Witness: That depends upon many circumstances. The filth of the town, a portion of the sewage, and the drainings from the streets, came into the Tame before. The water was stronger when the cesspools were broken up; it was more valuable, but I could not appreciate it.

Examination continued: I consider the water from the river is as valuable as the direct overflow from the sewage-tanks. I have never tried the overflow, but I know the land upon which Mr. Burbidge has tried the sewage from the main, and I do not think his meadows are worth 1s. more than they were twenty years ago, when they were floated from the stream. I do not think the irrigation now is one fraction better. I find by experience we get no better crops with the water than formerly. A few miles further down the river, the water is stronger than it was years ago. I should prefer carriers to take the sewage alone. I think 3000 acres in the neighbourhood of Birmingham, within five miles, might be irrigated if the system were extended, which, on account of the level, cannot now be reached. I would convey the sewage by open irrigation. I estimate the cost of

carriers and the entire works at about £10 per acre upon the land irrigated. In my opinion, the deposit from the tanks is of little or no value.

Mr. CAIRD: The question was put to you with regard to the relative value of the sewage from the tanks and the sewage after being mixed with Tame water. Would you think that the application of 20 tons an acre from the tank would have as beneficial an effect upon the crops as the application of 100 tons of Tame water—*i.e.*, five times the quantity?

Witness: I should not consider there would be any difference within four or five miles of Birmingham. I would as soon have the water from the Tame as the overflow from the tanks, or the sewage-water before it reaches the tanks.

Colonel FANE: If the whole of the sewage of Birmingham were intercepted, and there were no sewage-water run into the river at all, would you prefer using that, free of expense, as you do now, to paying 14s. per acre for the sewage?

Witness: I would pay 14s. per acre for the sewage, in preference to the water or the overflow from the tank.

The CHAIRMAN: You are aware that Mr. Burbidge rents a portion of the sewage of Birmingham? Supposing he were to give it up, would you use it if you were to have that land?

Witness: Yes.

The CHAIRMAN: Then, you consider it improves the land?

Witness: I do.

Examination continued: I think the application of sewage does not permanently improve the land. If applied for three or four years, it would be a serious injury if not continued; it would destroy all the better grasses.

By Mr. PAGET: By irrigating, I get a good crop of spring feed and great bulk of hay. Excessive floating and sewaging produce coarse and inferior grasses. My land is well drained with pipes, 4, 5, and 6 feet from each other. The nature of the subsoil varies.

By Mr. CAIRD: I apply irrigation in November and February, and after the hay harvest; also, twice during the summer to the grazing ground. I have not the least idea how many tons I put on. In November, I allow it to run on two days and two nights; in February, a day and a night; and, in the summer time, six or seven hours.

By Mr. ADDERLEY: Irrigation with pure water would not destroy the artificial and better grasses which the sewage does; and, probably, two-thirds of the benefit would be produced as to quantity.

By the CHAIRMAN: The cattle are fond of the grass grown on the irrigated land. It forces their milk, and the sheep feed their lambs better, but the meat produced is not so good. I think, if conduits were laid, ninety-nine out of a hundred farmers would use the sewage. I do not think that a large coating of sewage would be a judicious application of it.

By Mr. CAIRD: I estimate that the increased rental of the land would be 20s. or 30s. an acre, provided they got the use of the sewage.

Mr. *John King*, examined by Mr. ADDERLEY.

I occupy a farm of 300 or 400 acres in the neighbourhood of Birmingham, 72 acres of which have been under irrigation for the last three or four years. Before then, we were only subject to floods. Taking into account all the irrigation and land drainage, I have spent, upon an average, £15 per acre; and the result has been to improve it to the extent of half a ton an acre in produce, but the quality is not quite so fine. I think the deterioration is more from the gas-water which runs into the river than from anything else.

Mr. ADDERLEY: Is that the only injurious ingredient?

Witness: I think it is the principal; I cannot say it is the only one.

Mr. ADDERLEY: If you could prevent the gas-water entering the river, it would be more valuable?

Witness: If you will permit me, I will show you the stuff they filter the gas through [producing a small box, containing, apparently, oxide of iron]. Water, or anything which passes through this, must partake of its injurious qualities. It is phosphate of copper.

Examination continued: I have had experience in floating with pure water ten miles from Birmingham. It is not sufficient of itself; it requires that manure should be used. I consider that irrigation with sewage-water is as good as with pure water, and manure in addition. If a carrier were constructed along the valley of the Tame, I should make use of it if it came within my reach, and pay a certain reasonable sum for the sewage. If I were the owner of the land, I should be willing to contribute towards the cost of making the carrier, if they would prohibit all gas-water coming into it; otherwise, it might destroy the whole value of the sewage. I think it would be better to have the sewage direct from the sewers, than from the tanks. I have seen some land on which the solid deposit was placed this winter. The herbage looks very promising; there is a great improvement. I have not used it myself; I waited to see what others would do. As far as I have seen the result, I think I shall now do so. I shall carry it on the land which I cannot irrigate. I have no experience of the application of solid and liquid sewage to anything but grass. The solid, I think, would be good for any crop. For seeds, you might use the liquid with advantage; but it is a question whether you could use it upon arable land.

Mr. PAGET: You seem to have a great objection to gas-water. Has the gas at Birmingham always been purified with this sort of copper?

Witness: I cannot say how long. I think not always. It has not been discovered many years. It is found floating down the river, and we know its effects.

Mr. PAGET: Probably you know that gas-water is taken in some places to be used as manure?

Witness: I have heard some parties do.

Mr. PAGET: But you are of opinion that it is from the copper which this contains, and not from the manufacture of gas, that the mischief arises?

Witness: The gas-tar, wherever it goes, has no affinity to mix with the water, but settles on the surface like paint. It is as black as ink, and as pernicious as it can be.

By Mr. CAIRD: I would not pay anything for the sewage. I would relieve the town of the nuisance, and think I met them on honourable terms by contributing to the cost of the carriers.

By Lord HOLMESDALE: The land which is manured with the solid deposit is about five or six miles from the tank. The sewage is taken there by canal. It is not deodorized, and smells a good deal; but the air soon nullifies that. I think it promises to act well. The only charge made for it is the cost of putting it in the boats.

Mr. *Thomas Stanbridge*, examined by Mr. ADDERLEY.

I am the town-clerk of Birmingham. We were compelled to adopt the present tank system, in consequence of legal proceedings taken to prevent the fouling of the river. If we had not been compelled, the quantity of silt and carbonaceous matter in the sewage would have rendered it necessary. I think the solid matter at the bottom of the tanks is of considerable value, notwithstanding all that I have heard respecting the analysis of it by chemists. I believe the overflow of the tanks is also extremely valuable. The principal manurial value is in the water which flows off after interception. We have for many years contemplated a system of carriers, to go from the main outlet at Saltley, down the valley of the Tame a sufficient distance to allow of the sewage being absorbed on any day in the year. The present quantity is 12,000,000 gallons per 24 hours in dry weather; and the borough surveyor informs me his calculation is, that 3000 acres of land would absorb that quantity. As the water-closet system increases, it may be carried further. It is only within superior houses, built during the last twenty years, that water-closets exist. The difficulty in the way of carrying out the plan is the want of parlimentary powers of a simple and summary character. I think we should have power to borrow the capital necessary to construct the carriers and works. We ought to be able to apply to the Secretary of State, or some other proper officer of the Government, to appoint an arbitrator to settle the compensation to be paid for the easement of taking the carrier over a man's land, for the purpose of conferring this great benefit which we propose upon the adjoining agriculturists, or to enable the council to buy the land and enter upon it to construct the carrier.

Mr. ADDERLEY: How far would the Local Management Acts and their amendments, with the Outfall Act of last session, answer your purpose?

Witness: They are not sufficient; they are too cumbrous, and we find them altogether unworkable.

Examination continued: We are of opinion that the sewage is useful when properly applied. The solid matter in suspension in the sewage discharged into the river, it was alleged by a millowner, had filled up his mill-dam, and we had an action brought against us for it; and, since the sewage has been taken out, we have been threatened with an action for alleged deprivation of water by millowners. The water which is pumped up for the supply of Birmingham, we say, is our own; but the millowners complain that we take away a portion of their supply. We pay Mr. Wheelwright, a farmer, compensation for the loss of water impregnated with sewage which he used for irrigating purposes. I anticipate we should have claims from the millowners if we constructed carriers to carry the sewage down the valley of the Tame, because we cannot distinguish between the natural supply of water and that which would come into the river artificially. We ought to have power, having made the carriers, to come to the Secretary of State, and ask for the appointment of another arbitrator, to fix the rent-charge, or payment of some kind, to be paid by the owners, or the rate to be paid by the occupiers of land for the use of the sewage, in order to pay the interest on the money borrowed, and to create a sinking-fund for its repayment. That would be the only way in which the ratepayers of Birmingham could be recouped for their expenditure in the construction of the works. From the best information I have been able to obtain, I think we should be able to raise a sufficient revenue for the purpose.

Mr. ADDERLEY: One of the objects of this committee is to inquire into the best means of utilizing the sewage of cities and towns, with a view to the reduction of local taxation. Should you anticipate such a result, if that system were adopted?

Witness: I think this matter at present is only in its infancy, but, I am perfectly satisfied that benefits will arise to the ratepayers of large towns, by the utilization of sewage, as well as to agriculturists. I think that slyly and secretly, and at convenient times and seasons, a great deal of noxious matter is poured from the gas-works in Birmingham into the river Rea, which gets into the Tame. I consider that is most injurious.

Mr. ADDERLEY: What is the law with regard to the discharge from gas-works into streams?

Witness: By the Nuisances Removal Act, there is a penalty of £200 for discharging any refuse from gas-works into any stream or receptacle for water, and a continuing penalty of £20 a day. But that is not at all efficacious, and will never prevent the flow of gas-refuse into streams, for two reasons—the one, that it is absolutely necessary for the gas-works to get rid of their refuse in some form, and it is cheaper to them to pay such a penalty—far cheaper; the next reason is, that they can do it in times of thunder-storms and great rains, when people are in-doors and know nothing about it. At night-time, too, this refuse finds its way into the sewers, and I have no doubt that great injury is thereby done to the land over which the sewage flows. I have seen it in large quantities in the river Tame. I know the locality very well.

Mr. ADDERLEY: Is the legal penalty often incurred?

Witness: It is not, and it is impossible to prosecute under such an Act of Parliament. We have the same power under the Birmingham Improvement Act of last session, but, it is quite inapplicable. It is so important a matter, that I consider it ought to be made a misdemeanour; no fine will ever stop it.

Mr. ADDERLEY: Do you see any other mode of getting rid of it?

Witness: I see no other than that of making it a misdemeanour.

Mr. ADDERLEY: But that will not enable them to get rid of it.

Witness: It would be a more serious matter for a company to have to deal with. They realize such enormous dividends, that they care nothing about a £200 penalty. It is said, that it is the sewage in Birmingham which is doing the mischief; whereas, it is the refuse from the gas-works. The simple sewage is not injurious; the gas-refuse is. It has been alleged that what is called "pickle waste," which is composed of mineral acids, and used for dipping metals in order to put a polish upon them, is injurious to the sewage—the idea being that it is thrown away. To some extent it is, but I know that, to a greater extent, it is not thrown away. It is sold as a commodity, to be restored, and employed again in useful purposes. I am aware of a case—indeed, I prepared the contract—in which an eminent chemist in Birmingham contracted with a manufacturing firm to erect a tank on their premises, and pay a certain annual sum for the "pickle waste;" and that contract is in existence now. Moreover, it would be a mere drop in the bucket if it were put in the Tame, and it would combine with the water; but the gas-refuse combines with nothing.

By Mr. PAGET: I do not think it would be well for the corporation to take land and let it, after being sewaged. It would be an innovation upon municipal institutions, and they have plenty on their hands, without farming. From my knowledge of the locality, I think the farmers would be only too happy to have the carriers taken through their land. The first thing they would do after Parliament passed an Act enabling us to construct them, would be to go to their landlords, and get a lease of their land.

Mr. PAGET: I believe the refuse from gas-works is very valuable for manurial purposes?

Witness: I believe the ammoniacal liquor is.

Mr. PAGET: Are you aware that, in many places, the refuse of gas-works is considered very valuable as manure?

Witness: I am quite aware that one description of refuse is, and I know equally well that another description is the most noxious thing that can be applied to the land.

Mr. PAGET: Do you mean tar?

Witness: No; I do not mean tar. I believe it is oxide of iron mingled with soil, but I will not pledge myself to an accurate knowledge. I know that, at Water Horton, on land belonging to the Earl of Bradford, one of the best meadows was absolutely destroyed three years ago, and was as bare as this table, by the application of some soil which was drawn from the gas-works; and Dr. Voelcker was consulted as to what should be done with this meadow.

Mr. PAGET: Do you know the use they make of this peroxide of iron?

Witness: They purify gas with it.

Mr. PAGET: Do they, at Birmingham, use lime for the purpose of purifying gas?

Witness: I am speaking from information. I think that formerly they used lime, and now they use some other substance, which is, I believe, protoxide of iron, which cannot be applied to the land. It is a failure when applied to the land.

Mr. PAGET: Then, the mode of putting an end to the nuisance would be to prohibit the use of the protoxide of iron as a purifier?

Witness: No; I do not say that, because the refuse in the yard can be drawn away. But what I complain of is, that it is permitted to flow into the streams. Nothing that Parliament can ever do to prevent the pollution of streams will be efficacious until this is put an end to. I do not know what it is that flows into the stream, but I have here a letter which I sent to the borough surveyor, on the 3rd of January, which describes what I have seen many times on my journey by the railway, the gas-works being adjacent to the River Rea. "This morning, I saw the Staffordshire Gas-Works Company pouring into the river a blue fluid, which was boiling up from a pipe on the other side of the stream. Our attention was attracted to it a hundred yards further down—it was light blue or purple. A man was in the water, doing something to the pipe." That I have observed more than once.

Mr. PAGET: Then, it is very important for the utilization of the sewage that sufficiently stringent powers should be exercised over the gas-works to prevent their injuring the stream?

Witness: That I am persuaded of, not only for the utilizing of the sewage, but to prevent actions being brought undeservedly against the local authorities, for killing fish, and injuring the water in distant places, with which the corporation have nothing on earth to do.

Mr. ADDERLEY: Is there any such discharge as this actually into the sewers?

Witness: There has been, to the great injury of the inhabitants. As an illustration of what I said about pouring it in, I may state that the inspector of nuisances at Birmingham has been to me frequently, with complaints from persons in the vicinity of the gas-works, of the effluvium escaping up the drains and sink-holes, while they were asleep at night; and that, on awaking, they have been half suffocated with the fumes from the sewers.

By Mr. BLENCOWE: I think, considering the enormously absorptive power of the soil in the neighbourhood of the Tame, which is, in a great measure, gravel, possibly £10,000 might enable us to deal with the matter in the first instance, reckoning the amount we have already spent. I believe the farmers would be glad to get the sewage, and that they would go immediately to their landlords for new leases.

Lord HOLMESDALE: What use would summary powers be, if they would be so glad to have the sewage on the land?

Witness: We must have them, in order to deal with the parties. Some estates are entailed, and a tenant for life could not give us the necessary authority to take the carrier across the land. We obtained powers in the last session of Parliament to lay out £100,000 in the construction of main sewers, and we are at work now spending another £100,000. When the house and water-closet drainage is extended, the value of the sewage will be largely increased both in quantity and quality.

By Mr. CAIRD: £10,000 would enable us to construct carriers as far as Mr. Adderley's residence. We should be able to irrigate some thousands of acres. Birmingham is peculiarly well adapted for the purpose, because of its height above the outfall into the Tame. A good flow could be easily attained down the valley, so that the facilities for irrigation are great.

Mr. CAIRD: If £10,000 expended would insure so large a benefit to the agriculturists, the charge necessary to reimburse your outlay would be very small—little more than 1s. per acre. You would not, from your experience, doubt that any person could refuse to pay so small a sum for so great an advantage?

Witness: No.

Mr. PAGET: Supposing you could improve the land, as at Edinburgh, so as to be worth £60 an acre, it might form a material item in the local receipts?

Witness: Clearly so; but we cannot expect to make a fortune at once. It is very difficult to teach farmers anything. I think we should have a power from time to time to readjust the matter between the tenant and the landowner. If this system were adopted, we should be relieved from the actions to which we have been exposed.

Mr. CAIRD: I do not know whether, by the Outfall Act of last session, you could not relieve yourselves?

Witness: We have not yet adopted it, and there are great prejudices against it. We have a clause in our Local Improvement Act, which prevents us making an application to Parliament for further powers without the consent of the ratepayers in town meeting assembled; and that consent I am sure we could not get, because the people in Birmingham think that, Parliament having put us in this difficulty by requiring us to drain into the river, ought to help us out of it; which they could do by giving us power to make these carriers.

By Lord HOLMESDALE: I am persuaded that the solid deposit in the tanks is of great advantage, notwithstanding Dr. Voelcker's analysis. The corporation give it away at present, because there is such an enormous bulk of it. We are going to combine it with the night-soil of the borough, which will give us a very valuable manure. We shall not adopt the system pursued at Leicester. There will be no precipitation of the sewage by lime; there will only be the subsidence in the pits. The smell from the tanks is strong, but there are no houses near them. The deposit contains a large amount of animal matter. In the first tank made, which was a small one, you might have taken the maggots out by shovels full in the summer time. The night-soil will be taken to the outlet of the main sewer at Saltley, where we have erected a steam-engine for the purpose of lifting the solid deposit out of the tanks. There we intend to screen the night-soil; because, in a large town like Birmingham, there are many things in it which are of no use. We shall then crush the small coals and cinders which are in it to powder, which will be useful as a top dressing for land. I have tested that, and found that it is a manure of unquestionable value. It is a remarkable fact that, when that carbonaceous matter is crushed, the most filthy night-soil you can conceive becomes comparatively without smell.

By the CHAIRMAN: The Act of Parliament I referred to would not be a local Act, because I apprehend the system, if advisable, would be applicable to all towns in England. The carriers would be open except where they passed adjacent to dwelling-houses. I am sure that, if we got those powers, and the means to carry out the plan, the price of sewage would increase. We should let the farmers have it at first for nothing, in order to make a market for it. I have seen the application to Mr. Burbidge's land, and know that the results are enormous. The value of the land before he applied the sewage was not half what it is now. I think the corporation should have the control of the sewage. They would extend its use as far as they could, and it would then be of great importance to us to enforce the construction of water-closets.

The CHAIRMAN: Supposing your system of sewerage were perfected, should you still think it injurious for the gas-refuse to go into it?

Witness: I think it would be, because gas-refuse appears not to combine with any substance whatever, but hangs about the herbage. If it were put into the river, it would be equally noxious; it would then poison the fish, and make the water unpalatable to the cattle. The water supply of Birmingham is pumped partly from the Tame and partly from brooks. The Tame rises in the black country, and flows through a very populous and dirty district, where sanitary matters are taken little notice of, so that it is considerably polluted before it reaches Birmingham, and we have to suffer for the sins of those who sin against the Tame.

By Mr. CAIRD: I believe chemists have said that there is a large amount of organic matter in the water. I do not know whether it is filtered by the company; I think it is kept in storeage-reservoirs for use. I have used the intercepted sewage myself for two years, and I am satisfied that it is a valuable manure. On land belonging to a relative, I have seen it produce most extraordinary crops. The sewage is very much deodorized by taking out the solid matters. It smells a little, but is very much clearer than when it goes into the tank. Formerly, when the sewage was put into the river, the solid matters deposited on the banks for miles down; it filled up all the holes, and in some cases diverted the course of the stream. We have purchased 30 acres of land lately, for the purpose of depositing the intercepted matters upon, and to prevent litigation as far as possible.

The CHAIRMAN: Are you aware that there is a considerable amount of ammoniacal matter in gas-water?

Witness: I am quite aware of it.

The CHAIRMAN: If that ammoniacal matter could be separated from the tarry matter, might it not be applied with great benefit to agricultural purposes?

Witness: Its benefit would not be immediate; it would take considerable time.

The CHAIRMAN: But, if you could fix the ammonia in the gas-water, might it not be applied with great benefit to agriculture?

Witness: Well, I should think it might.

Lord HOLMESDALE: But is there any method of extracting it?

Witness: I believe it is done now by economical gas companies. Here is a gentleman present, Mr. Hughes, who can inform you.

THURSDAY, APRIL 10.

The committee sat for some time with closed doors to consider resolutions proposed by Mr. PAGET.

Mr. *Blackburn*, examined by the CHAIRMAN.

I have had some experience as an agriculturist, and have used liquid manure, and also water as a vehicle for conveying other matters, such as gas-water, to land at my farm in Kincardineshire, during the last eight years. As a scientific engineer, I have examined most of the places where the system of sewage manure has been adopted. My own experience applies only to liquid manure on the farm, but, I have paid great attention to every place in the country where sewage manure has been used during the last twelve years. At Rugby, it was originally designed to fertilize a much larger tract of land than is now found practicable. It was applied over 450 acres which were not in a fit state to receive sewage from the hose, nor were the grasses growing there those which were capable of yielding the largest amount of nitrogenous vegetable matter.

The CHAIRMAN: Have you observed any difference between the sewage of Edinburgh, Rugby, and Watford?

Witness: It is difficult, in the sewage of Edinburgh, to detect its origin. The sewage at Rugby and Watford arrives at the outfall in its integrity; there is also not so much odour in the sewage of those towns as at Edinburgh, owing to the latter being derived from the accumulations of cesspools.

Examination continued: I have only seen sewage applied to grass. It has thus been attended with very good results, especially at Edinburgh; but they use enormous quantities there. The best effect was produced at a farm near Edinburgh, where 2000 tons per acre, applied to crops of Italian rye-grass last year, produced £41 rent per imperial acre. That was a greater result than was ever obtained with open channels. I think the system of open channels is a great waste—a waste of time and a waste of ground. I cannot think that land is fertilized by the large amount of sewage flowing over it, but by that which the land absorbs. At Edinburgh, the quantity of liquid which flows into the sea after flowing over the land, is not nearly so deodorized as it might be; therefore, I do not recognize the crops there as due to the quantity of sewage applied; it might be applied over a much larger area than it is at present. In the application of liquid manure in a very concentrated form, there is a certain amount of smell, but it is very soon absorbed; if properly diluted, there is no smell. I have frequently been on the ground belonging to Lord Essex when the application of liquid manure was going on, and observed little or no smell. The amount of nuisance from a dressing of stable manure or night soil, if put on grass, would last several days, whereas, if put on land diluted with water, it would soon be absorbed and become inodorous. My opinion decidedly is, that the application of sewage in a liquefied form is the best mode for agricultural purposes. It is much cheaper to convey anything in water than by carts. I made some experiments to ascertain that before I put down pipes at my farm, and found that it cost 3¼d. per ton conveyed by cart, and only ¾d. pumping it from the tank and conveying it by pipes, the distance varying from a quarter to half a mile. With land that is properly drained, I do not see the slightest objection to the application of sewage on the ground of creating a nuisance; but it must be considered that thoroughly drained land is a *sine qua non*. It is useless to put it on undrained land, or naturally dry land—it is throwing it away. I think sewage might be applied to wheat; but, as a rule, I think I should apply it to those crops which would take the greatest quantity, and yield the largest return. There are many manures that can compete successfully with sewage for green crops, but none for grass. It would be necessary to have some underground pipes, or other means of conveyance, for the purpose; and, therefore, I think it would be more convenient for those crops which require the greatest quantity, and not those which require small quantities at distant intervals.

The CHAIRMAN: What quantity of sewage have you found most profitable to apply to an acre of land?

Witness: That instance I gave at Lochend farm, where 2000 tons of sewage per acre were applied by underground pipes and hose, independent of farm-yard manure, is the best return from a given quantity. The nature of the land there is rather light loam upon a sand soil, but the sewage at Edinburgh is employed upon clay and land of every description—some portion being blowing sand.

The CHAIRMAN: Was it from that experiment that you came to the conclusion that the sewage of Edinburgh was wastefully applied?

Witness: I made an examination of it after it had passed over the land, and I thought it was flowing into the sea not so much deprived of manurial matter as it should be.

The CHAIRMAN: What is your opinion of sewage as compared with other manures?

Witness: It is difficult to assign a value to it; we have no recorded experiments showing its value. I have tried guano against liquid farm manure, and the result was greatly in favour of the latter; but I also found that half the quantity of concentrated manures, washed in water, would yield a better return with grass-land than a larger quantity left to the mercy of the elements.

The CHAIRMAN: Have you seen the experiments at Rugby by Mr. Lawes?

Witness: I was there last April or May, and saw what was going on; but I did not think he was adopting those plans which would lead him to ascertain an accurate result as to the value of sewage. There was an uneven distribution, in the first place; the sewage was conveyed over the land in open channels; and, judging from the growth, there was a want of uniformity. He had, also, not endeavoured to get that kind of grass best suited to the application. They were making experiments with those grasses adapted to its previous condition as pasture-land, and I do not consider them suited to the application of large quantities of sewage. I know that on that point a difference may be made in the quantity of grass alone of 50 per cent.; therefore, looking at a certain quantity of crop representing a given amount of sewage, attention to this item would form a very important matter. I was at Carlisle last June, and, to my surprise, I found a meadow, under a June sun, occupied in drying hay, instead of being made the most of in growing grass. They were deodorizing the sewage there, which I did not consider at all necessary. The sewage arrived at the outlet before decomposition commenced, hence you could observe the fœcal matter in its integrity; and, there being no decomposition, there was nothing to deodorize.

By Mr. PAGET: The sewage of Lochend farm was simply town-sewage from Edinburgh. It was raised up the necessary height by a water-wheel, conveyed by underground pipes, and delivered on the land by gutta-percha hose. The height it had to be raised was about 20 feet. I cannot tell the cost of raising it that height by engine power, but it is an ascertained fact. On my farm it used to cost me ¾d. per ton, including 8 per cent. interest upon the outlay, for distributing the sewage. Under proper arrangements, one man with hose could distribute 200 or 300 tons a day. On a certain scale of operations, that expense would include the cost of raising the sewage 20 or 30 feet by suction and force if there were enough to keep the works in constant use. Sewage is best suited for Italian rye-grass. Timothy-grass will grow under sewage 4 feet high. I have been paying attention to the subject of the best grasses for sewage and liquid manure for some years, and have found an enormous difference in them. In some parts of my field, where Italian rye-grass has been thrown out, there has been a natural grass, indigenous to the soil, spring up, but it has not been half the height of the rye-grass. Fox-tail is a good grass for the purpose of irrigation, and cows-foot grows to great luxuriance. There are seven or eight kinds altogether, and I know Timothy is one of the very best. It might require time for the purpose, but I know that if you apply liquid manure to land, certain varieties of grass will spring up, but I do not think that those grasses which spring up, and are, therefore, indigenous to the soil, are those calculated to yield the best amount of vegetable matter. For instance, the Italian rye-grass brought up a very good grass on my farm 18 inches high, but the Italian rye-grass itself was 3 feet 6 inches high. I think it is one of the most important things to be observed before beginning to irrigate, to sow the land with the kind of grass best calculated for sewage. At Rugby, the tops of the ridges were almost bare, but down in the hollows there was rank luxuriance, so that that part was rotten before the other was fit to cut. To produce a good crop, each square yard of land should be adapted to absorb the quantity due to it. I would make the land as level as possible. At Rugby, the land is in very high ridges, 18 inches from the top to the bottom. Any natural inclination of the land, of course, you could combat with, but, as a rule, it should be so level that each square yard would absorb its proper proportion.

By Mr. BLENCOWE: The sewage could not be applied by irrigation at Lochend farm. I do not think there is much difference in the expense of irrigation, and the application of sewage by underground pipes and hose, but to carry out irrigation by the catch-meadow system is a very nice operation. The meadows at Edinburgh cost an enormous sum to lay out. Sewage distribution by pipes has never yet had a fair trial, judging by the works I have seen. To get a certain growth from a given amount of seed, I should say that one-third the quantity of sewage distributed by the pipe and hose system, would be as fully efficacious as the quantity required by the catch-meadow system.

By Mr. GREGSON: I do not think that, at present, sewage has any saleable value. The urgency of the question just now, must make every one feel that it is a thing to be got rid of, the amount of dilution is so enormous; the sewers convey all the subsoil water, and a large quantity of spring-water. I believe it has been given in evidence, that from 7 to 10 gallons of water per head per day would satisfy all sanitary conditions, whereas, in London, it amounts to from 35 to 45 gallons. If it were once recognized that the sewage must go to the soil, attention might be paid to those conditions, which would render it more valuable for that purpose.

By Mr. CAIRD: My comparison between the product of the Lochend farm and the Craigentinny meadows, is a correct one, because I had the opportunity of comparing the results of my experiment with that portion of the latter, where Italian rye-grass was grown, and I consider the crops were about equal, but that which obtained the results were about one-third in favour of Lochend. The land there is arable. I came to the conclusion that 2000 tons of sewage per acre had been used there, from the number of days during which it was applied, and the capacity of the pumps. I think there were about three acres. The crops sold for £41. It was a succession of crops of Italian rye-grass, and there were no less than 60 tons per acre in the 5 crops. I only give that as an estimate from the crops I had myself. I do not know that the comparison between Italian rye-grass and other grass is a fair comparison, but I am not at all sure that you might not select a variety of grasses which would suit sewage, so as to come near to it.

Mr. CAIRD: We have evidence here that the natural grasses, after the application of sewage at Birmingham, seemed to adapt themselves to that application, and that nature herself seemed to give the grasses which grew with the greatest luxuriance; there would not, therefore, seem to be any necessity to select a particular kind of grass, but to take that which naturally presented itself, and apply the system.

Witness: That is not the result of my experience.

Examination continued: It would depend very much upon the quantity of sewage to be applied as to what the cost of the underground-pipes would be; taking it at 2000 tons per acre, the cost would be about £8 per acre. The Edinburgh system cost from £15 to £20, and the Birmingham from £15 to £18. The gutters are also a constant expense to keep cleaned out. The early working expenses would not be so great as the cost of machinery.

By Mr. DU CANE: I have used 1200 tons through the season upon my own farm, but it was not all manure. I use a dressing of liquid manure, and then I give two dressings of water, and keep the meadow moist until the grass has grown. I have applied it to carrots and onions. There are many great drawbacks in applying it upon arable land. In the first place, there is the great additional wear of pipes by having them upon uncropped ground; it is also very difficult to arrange things so as not to go upon the portion to which you have applied the manure; if you do so, it is a perfect mortar. Then, in applying it to grain-crop land, you have not facilities for dragging the pipes over without disturbing the young plants, and the expense is greater because it requires more people to manage it; but, I think some plan might be devised, by having shifting pipes laid down in the drills. I have had some portion of my farm under plain water irrigation for eight years. The land was full of mosses, which were destroyed the first year, and full of thistles, which were rotted down, and good grass brought up for pasture. I should have looked for a very much better effect from the use of sewage.

By Mr. PAGET: The produce in milk from cows fed upon the grass of sewaged land is enormous in quantity; it also makes excellent butter and cheese.

By the CHAIRMAN: Italian rye-grass is exhausting to the land; but that is the very thing which the farmer wants. His business is to put in what the soil requires, and the more exhausting the crops he gets, the better for the farm. I do not say that sewage is the most nourishing manure for the land. Manure may act in two ways—by what it gives to the land, and by acting as a solvent. Ammonia acts as a solvent, and is in that way beneficial to the soil, more than from any good it does *per se*. Plants are more capable of taking up the manure which is administered in very small and divided particles than in larger portions; the fibrous portions are not so immediately available.

The CHAIRMAN: It has been stated here that the finer qualities of grasses are wholly destroyed by too large an application of sewage.

Witness: I can imagine that they would be destroyed by too large an application if the sewage were applied to ground not fit to receive it, that is, land with immense hollows. If you wish to irrigate upon the channel system, there should not be a greater depth than the thickness of half-a-crown.

By Mr. BRISTOWE: I cannot put a money value upon sewage, because, in many towns, the application is too expensive, on account of the dilution. I should not mind paying a certain amount for it if brought to my door.

Mr. *Fenton*, examined by the CHAIRMAN.

I am the engineer of the local board of health at Croydon, and connected with the sewage works there. I was previously at Chelmsford, in Essex. At Croydon, the system is that of pipe-drainage almost exclusively: and the consequence is, that the sewage-water and solid matter are delivered in so short a time into the tanks at the mouth of the sewer, that no putrefaction takes place. When I went there in 1857, they were running about one-third of the sewage of the town, consisting of 16,000 inhabitants, on about 15 acres of land. The consequence was, that the whole surface of the land was covered with the soil; and it was so offensive that, in many cases, you could not go anywhere near without being disgusted, nor could you walk upon any portion of it. The present population of Croydon is about 20,000; that portion the sewage of which we employ, contains about 18,000. After the sewage was put on the land in 1857, it was ploughed up, and mangel-wurzel put on; and I have seen there roots three feet high, which shows that sewage is applicable to growing roots.

Mr. CAIRD: The conclusion you draw from that is, that the land could not have been exhausted by the use of sewage previously?

Witness: Yes. The present system adopted at Croydon is this:—The water is run into the filtering-tanks, and there all the solid matter is taken out—not the whole that is in suspension, but all the offensive solid matter. It is then run, by means of irrigating-channels, on to the land. The channels are put along the higher surface of the land; there are also similar channels from 40 to 50 feet from the first, and there are certain stops, so as to drive the whole of the water through the grass and over the land before it goes into the clear-water-channels at the bottom, from whence, deprived of all its manurial properties, it is discharged into the stream. It is found necessary, after being collected in the second channel, to redistribute the sewage over the field, which is at a lower level, in the same manner as over the higher one. A great deal of it filters into the gravel, and through the gravel into the second channel. After passing over the first field, the water is quite clear—there is no appearance of cloudiness in it: and, after passing over the second field, I have tested it, and there is no earthy nor unpleasant taste with it—you would not tell it from pure water. When it leaves the tank to go on the field, it is very foul. The quantity of land which has now been under irrigation for nearly twelve months is 240 acres. The quantity irrigated at one time is from 20 up to 50 acres, according to the rain. We find it necessary, during heavy rains, to turn the water over a larger quantity of land than in dry weather. Last summer, I have known 10 acres take the whole of the sewage of Croydon, amounting to 800,000 gallons in twenty-four hours, without being perceived at all in any of the lower lands, or irrigating channels. Sometimes, we have had to distribute it over 50 acres; then the quantity has varied from 1 to 2 million gallons, as the increase from rain is enormous arising from the extent of rainfall, and the porous nature of the soil of the surrounding country, and also from the existence of pipe-drainage, which enables it to flow off more quickly. In 1860, we had only about 56 acres under irrigation. The crops were very much overdone with sewage-water. The land was partly cropped with wheat, red clover, Italian rye-grass, and common meadow grass. The effect upon the land which formerly was poor was, that the growing crops producing before only a guinea an acre were sold at public auction at much enhanced prices. At the first sale, the meadow grass sold for £4 per acre, and the second crop for 30s. The first price of the red clover was £4. 10s.

per acre, and the second £3. 5s. The first crop of Italian rye-grass sold for £3 per acre, and the second for £2. 15s. In one field, which was not irrigated on the surface, the water gathered through the undersoil, which was porous gravel, and the result was that those 10 acres, which had never been known to produce more than four or five quarters of oats, that year produced twelve quarters. During the year 1861, the land was let to Mr. Marriage, who has laid it out; it had not been adapted for sewage irrigation before. We have let the whole 300 acres to him on a lease for eight years at £5 an acre. He would not have taken it at all, or given anything like that price for it, but for the application of the sewage. We allow him £3 per acre for levelling and preparing the land for the purpose of irrigation, and he keeps it in repair. The rent which the board now give for the land is an average of £4 per acre; formerly, it was let to a tenant at 21s. We have sunk three years profit upon it as an investment to prepare the land. I anticipate it will be worth a great deal more at the end of Mr. Marriage's term. The Italian rye-grass has been selling during the last few days at 1s. per rod, which is £8 per acre. It is now eighteen inches high. It is bought by the cowkeepers and small owners in the neighbourhood. There are about 30 acres of it. The crop is very much earlier in consequence of the application of sewage; I think it is quite impossible that any other manure would produce it so early.

By Mr. PAGET: We have been for some years in trouble at Croydon, owing to the injury which the river sustained from putting sewage into it. I think by applying the sewage to the land, we have entirely obviated that inconvenience. An injunction was granted against the Croydon Local Board in January last, but Vice-Chancellor Wood, in his judgment, said, it was clear from the evidence laid before him, that the system of sewage irrigation was perfectly effectual in cleansing the water, and, therefore, the complaint must arise from some defect in the mode in which it was carried out, if the river was at all injured by the sewage; so that, he should give Mr. Bidder the benefit of the injunction, because it could do us no harm if we carried out the system properly, and it would be, in fact, a spur to us to be more careful. The injunction is against our discharging the water into the river in an injurious condition. At the time we were applying the sewage to 15 acres only, I think we were properly open to the complaint, but we are not now.

By Mr. AYRTON: We have had the water as it flows into the river analyzed. I cannot give the result, but I think the quantity of ammonia in it, as it flows from the tanks was 4 grains per gallon, and, as it goes into the river, it is hardly perceptible—some decimal part of a grain. It was analyzed by Dr. Thomson and Mr. Way. It differed very little from river-water.

By Mr. PAGET: Our tenant is laying all the land down for grass—I think Italian rye-grass. We have a system of water-closets almost throughout the town.

By Mr. BLENCOWE: We take the solid matter out of the sewage, before it is put upon the land, and we sell it. Last year, we sold 1200 tons at 1s. per ton. The sewage is first passed through a perforated brick wall, and then through two perforated plates, with straw between them. When it comes out, it is much discoloured, but there is no solid matter in it.

By Mr. AYRTON: No doubt, the solid matter is worth more than 1s. per ton, but we wanted to get rid of it, and did not like to raise the price. We now sell it at 1s. 6d. per ton. The filtering-works are opened, and the solid matter taken out once a month, when the quantity is about 100 tons. There is a very great demand for it by the market gardeners.

By Mr. PAGET: I consider it necessary to have the tank still, as the upper fields, over which the whole passes, would, in consequence of the soil not being broken up, be covered with offensive matter. We can irrigate any meadow we please separately, but the system pursued is to take the upper area in sections. The ground is so situated, that we can do this by natural gravitation. The system has been hardly sufficiently tested to enable us to tell whether there is much difference between the upper and lower land.

By Mr. AYRTON: The mortality of Croydon is about 19 per 1000, and the population is increasing at the rate of 1800 a year. I do not think there has been any difference, since the system of irrigation commenced, as to the mortality. It is carried on in another parish.

By Mr. CAIRD: The lower land never gets the first of the sewage. It always gets the comparatively clear water. The whole is let at the same rent.

By Mr. AYRTON: It is all level land. The surface-soil is loam, varying from 3 inches to 2 feet. Under a portion of it is gravel, and the remainder clay. The gravel is 5 or 6 feet thick. The clay is very retentive; it is not more than 3 feet in thickness; and under the clay is gravel again. We have broken through the clay-bed in many of the main channels. The great disadvantage of the clay upper-soil is, that the water will not penetrate to the gravel.

By Colonel FANE: The original cost of forming the tanks, &c., was about £3000. The money was borrowed for the purpose, and the repayment spread over twenty years, on the security of the local rate. It is now being paid off by degrees.

By Mr. CAIRD: The distance from the outside of the town to the filtering-works is about half a mile, and from the works to the meadows about another half mile. There has been a complaint about letting off the water into the river after irrigating the land, but no legal steps have been taken in consequence. As at present carried out, there is no complaint of nuisance whatever. I do not think that £3 per acre represents the cost of preparing for irrigation; I believe it will cost the tenant £5 altogether.

By Mr. AYRTON: There is a fall in the land of about 20 feet per mile, and, with the exception of 28 acres, it is all of a uniform slope. Those 28 acres are rather flatter, and the water lies upon them; the soil is clay over gravel. We have put on as much sewage as 43,000 gallons per day, and kept it on from 5 to 8 days at a time, according to the nature of the soil—monthly, through the winter as well as the summer.

By Mr. DU CANE: In marsh land the system would have been as at Edinburgh, by deep channels, which would act for drainage as well as irrigation purposes. I do not think the expenses of open irrigation are anything like so great as with hose and pipe.

By the CHAIRMAN: I do not think that if our board could have had a larger area land they would have engaged it. I have had more land offered me, but I did not think it advisable to take it, because, in order to get a large result from the land, you must put a great quantity of sewage upon it. Our experience to the present time is, that the number of acres we have are quite sufficient. At Mansfield, Mr. Tebbett, the gentleman who has charge of the land there, told me it did not matter what grass was sown on the irrigated land, that it eventually all came into that kind which he called sewage-grass, and I have had specimens from Edinburgh which confirmed his statement. The farmers round us, have not made application for the sewage; they knew they could not get it. If they could get it, I think there would be a number of applicants for it, and we should get a larger amount for it than before. I think the land, as far as I can see, would let for £10 an acre. I think there could not be so much manurial property in the sewage after passing over the first field, but, it is allowed to be on the second field for a longer period.

The CHAIRMAN: Do you think it was advisable to let the sewage on the land under the circumstances?

Witness: It is a very difficult thing for a public board to carry on operations of trading and marketing. The sale of crops must have been by public auction; they could not be retailed except at an expense, and I think it better to sacrifice a portion of the value and get rid of the anxiety.

Mr. AYRTON: Do you think, having regard to the town and municipal arrangements, that the best mode of dealing with the sewage is for the authorities to rent land for the purpose of utilizing it, and then sub-let the land?

Witness: I think it is. In 1857, we found that the parties in the occupation of the land sometimes used it, and sometimes did not. The water was, in consequence, sometimes sent out in a foul state, and Mr. Bidder brought his action.

Mr. AYRTON: Then it is necessary for the town to keep the control so as to insure the sewage being used with due regard to sanitary conditions?

Witness: We let the land subject to this condition, that they are liable for any action brought against the local board for damage arising through the water not being purified.

Examination continued: I think eventually we shall be able to make a charge for the sewage as sewage; but I shall be content, for a series of years, with what we now get, until the farmers begin to appreciate the value of it. I think if the person who now rents the land were to let it, he would get an advanced price for it. The only difficulty we have is, as to whether the market for it is not limited. We have had large crops of hay from the land. The clover-hay sold at £6. 10s. per ton. Our lease of the land is for fourteen years from last Michaelmas. The sewage-water, which is about 1-20th of the bulk of the river, enters the stream about four miles from the head. It is the outcrop of the chalk, and yields from 2 to 10 million gallons per day. If we did not pass the sewage over the land, we must have had subsiding-tanks, which would have entailed enormous expense. I think close pipes are better than open channels for carrying the sewage to the land; but the open water-courses on the land are better than pipes, and they are maintained at less expense. In 1860, we had only two men at work on the 60 acres—one constantly, and one occasionally; but the work was not well done. There is no nuisance at the filtering-works in the winter months, but, in the summer, we have had to deodorize the sewage. We have used a small portion of carbolic acid and lime. There are houses within a quarter of a mile. We had complaints of nuisance when the works were first established, but there have been none since. Our tenant has to pay one-half of all the expenses of the filtration, in addition to his rent.

(*To be continued*)

Legal Intelligence.

WESTMINSTER POLICE COURT.

THURSDAY, APRIL 10.

(*Before Mr.* PAYNTER.)

Mr. *F. H. Mair*, of 9, Gloucester Terrace, Pimlico, was summoned by Mr. Hurst, collector to the Equitable Gaslight Company, for £2. 6s. 4d. arrears.

Mr. *Mair* admitted the debt, but claimed a deduction of £1. 10s. deposit made with the company at the time the gas was put on, and 3s. interest upon that amount. He said he should not have appeared at that court but upon public grounds, and to expose the abuse to which the gas monopoly gave rise. He had an establishment in the neighbourhood of Covent Garden, which was supplied with gas by the same company as his house in Gloucester Terrace, and it was his practice to pay at Covent Garden for the gas consumed at both places. Being taken ill, the Covent Garden amount only was paid there, and the other fell into arrears for some weeks, in consequence of which the gas was cut off, at which time, deducting the deposit and interest thereon, he only owed 8s. 10d., less the charge of 2s. 6d. for cutting off; and he thought it was an extremely arbitrary proceeding, and showed the abuse to which the present state of the law gave rise. He did not understand why, as a respectable man, he should have been so treated.

Mr. HURST replied, that he had been summoned, as other people were, after the usual applications had been made for the arrears. There was nothing unusual in his case.

Mr. *Mair* repeated, that he did not combat this case upon his own account, but upon public grounds. He appeared there on behalf of the poor, who were not, perhaps, much in a condition to defend themselves in such cases. People had not the option of dealing wherever they pleased for gas.

Mr. PAYNTER asked what he had done for light since the gas had been cut off?

Mr. *Mair* replied that he had been burning wax candles and composites.

Mr. PAYNTER inquired under what Act of Parliament he claimed a right to interest upon his deposit; he had never heard of its being allowed before.

Mr. *Mair* observed that he was positive that a recent Act of Parliament entitled persons to interest, and that was one of his reasons for coming before the magistrate; he wished the poor to become acquainted with it through his means.

Mr. PAYNTER turned to the Metropolis Gas Act, passed in 1860, and said that Mr. Mair was quite right: the company, where a deposit was left, was bound to pay the consumer such rate of interest as the magistrate should determine.

Mr. HURST said that the amount of the deposit was being constantly consumed by the burner of the gas; and in this case it was consumed in only six months.

Mr. PAYNTER inquired how many consumers there were?

Mr. HURST replied, 5000 or 6000.

Mr. PAYNTER observed that that would produce a large sum of money.

Mr. *Mair* said the interest was very material to poor people.

Mr. HURST said that a deposit was only taken in some cases; it was done as a security for the payment of the gas consumed, and had been found necessary. If the payments were kept up, and there was no reason to apprehend loss, it was often returned in two or three years.

Mr. PAYNTER said it would be his bounden duty by law to give Mr. Mair interest upon his deposit, and he should not allow the costs of the summons.

Mr. HURST said that the deposit was made before the Act of Parliament came into operation.

Mr. PAYNTER observed that he should only calculate the interest from the time of the Act coming into operation. Reckoning it at 5 per cent., he should award Mr. Mair 2s. 3d. That amount added to the deposit of £1. 10s. deducted from the claim of £2. 6s. 4d. (less 2s. costs) would leave the defendant 12s. 1d. to pay.

SATURDAY, APRIL 12.

THE ALLEGED DISCHARGE OF GAS-REFUSE INTO THE THAMES.

In this case, which was reported in our last number, the Chartered Gas Company were summoned by the Thames Conservancy, under the 102nd section of the Thames Conservancy Act, for allowing offensive matter to run into the Thames. The evidence went to show that, on the 26th of February, and on the 12th and 15th of March, a quantity of gas-refuse was seen to flow from the company's gas-works, which caused a most unpleasant effluvium. It passed through a pipe at the rate of about a gallon a minute, and was very offensive. The summons was heard a few days previously, and was adjourned in order to afford time for the magistrate to consider his judgment, it being contended, on behalf of the defendants that, under the Act of Parliament, an actual knowledge of the complaint must be proved, in order to substantiate a conviction, that there was none shown in the present case, and that it was possible the nuisance occurred through the leakage of a valve in the pipe by which the refuse was conveyed away.

Mr. PAYNTER now said he had no doubt that the liquid complained of did pass from the company's works into the Thames, and that it was very offensive. He had looked over the case of the Staffordshire Gaslight company, which had been referred to by Mr. Sleigh, and he found that that company was bound by a private Act, in fact by a deed. This (the Chartered Gaslight and Coke) Company was also regulated by a private Act, and it was an incorporated company. It was remarkable it had not been shown by any of the witnesses, either on the part of or against the prosecution, that any communication had been made to the company giving them information of the existence of the nuisance complained of. As that was the case, he should not allow the witnesses on either side their expenses, but should fine the defendants 40s.

Miscellaneous News.

COMMERCIAL GAS COMPANY.

The Ordinary Half-yearly Meeting of the Proprietors of this Company was held at the London Tavern, Bishopsgate Street, on Friday, the 11th of April inst.—JAS. HOLBERT WILSON, Esq., the deputy-chairman, presiding.

The notice convening this meeting, and the minutes of the last meeting, having been read, the seal of the company was affixed to the register of proprietors.

The following report and statements of account, having been previously printed and circulated, were taken as read:—

The directors report that a profit of £14,514. 18s. 10d. has been realized during the half year, and which is applicable to the payment of dividends.

The further extension of mains of an increased size, for the supply of gas to the Isle of Dogs, has become necessary, and contracts have been entered into for that purpose.

The directors have given their attention to the system adopted in the payment of the company's dividends, and a resolution upon the subject will be submitted for the consideration of the meeting.

The following directors, viz.:—Charles Salisbury Butler, Esq., M.P., James Holbert Wilson, Esq., and Robert Beeton, Esq.—will go out of office by rotation; who, being eligible, have given notice of their intention to offer themselves for re-election.

John Jones, Esq., auditor, will go out of office by rotation; who, being eligible, has given notice of his intention to offer himself for re-election.

STATEMENT OF ACCOUNTS,

Showing the Actual State and Condition of the Concerns of the Commercial Gas Company, for the Six Months, ending the 31st Day of December, 1861.

I. CAPITAL.—*State of the Account at the End of the above Six Months.*

Statute, or authority, under which raised.	Number of Shares.	Amount per Share.	Paid up per Share.	Total Paid up.	Total Capital.
Shares	11,697–4/5ths.	£25 0 0	£25 0 0	£292,445 0 0	
	7	....	7 10 0	52 10 0	
	2/5ths–1/10th.	....	....	1 5 0	
	1/5th –1/10th.	....	....	5 5 0	
COMMERCIAL GAS ACT, 15 & 16 VICTORIA, cap. 155.	5,771–4/5ths–1/20th.	....	Various.	15,297 2 6	
					£307,801 2 6
	17,477–1/5th–1/10th.				

	Rate per Cent.	Amount.	
Borrowed moneys	4	£18,600 0 0	
	4½	4,000 0 0	
	5	18,700 0 0	
			41,300 0 0
		Total capital . .	£349,101 2 6

II. REVENUE.—*Account during the above Six Months.*

RECEIPTS.			EXPENDITURE.		
Balances brought forward		£422 2 10	Management—		
Sale of gas—			Directors allowances	£750 0 0	
At 4s. 5d. per 1000 feet	£46,600 7 7		Salaries of secretary and clerks	896 2 8	
Public lighting and contracts	6,833 4 7		Collectors commission and pay	454 9 7	
	53,433 12 2		Rent, rates, and taxes of offices	50 0 0	
Sale of residual products—			Stationery, printing, and general charges	833 17 4	
Coke	£9,640 13 2		Payment to auditors	75 0 0	
Breeze	338 15 6				£3,059 9 7
Tar	613 19 0		Manufacture of gas—		
Ammoniacal liquid	364 1 10		Coals, including carriage, dues, &c.	£25,488 12 6	
	10,957 9 6		Purifying materials	880 2 7	
Miscellaneous receipts	283 11 2		Supervision and labour	6,946 13 5	
			Tools and other implements	228 19 7	
			Ordinary repair and maintenance of premises	2,379 2 11	
			Rents, rates, and taxes of manufactory	1,581 3 11	
					37,505 0 11
			Distribution, including service-mains, pipes, &c.—		
			Ordinary repair and maintenance	£2,222 16 4	
			Meters—		
			Restoring and replacing	746 19 11	
					2,969 16 3
			Arrears—dividend		6,156 0 5
			Interest paid from profits, on £41,300, borrowed capital, at per cent.		891 9 8
			Balance for shareholders profit		14,514 18 10
		£65,096 15 8			£65,096 15 8

We have examined the above accounts, and certify them to be correct.

CHARLES SALISBURY BUTLER, *Chairman.*
GEORGE JAQUES, *Secretary.*

The CHAIRMAN: Gentlemen, in moving that the report and accounts be received, adopted, and entered on the minutes, I shall not have to detain you with many observations. The report, as you see, is a very brief one; but it tells you, in the few paragraphs which it contains, the whole of what we have to say to you. It informs you, in the first paragraph, that £14,514. 18s. 10d. has been realized during the past half year, and is applicable to the payment of dividends. This fact shows to you, I think, very clearly that the working of your establishment has been very satisfactory during that period. But, although satisfactory in its results, the half year has been one of very considerable anxiety to us. It was the first half year that we have been under the operation of the Metropolis Gas Act. We commenced in June last, upon the report of our engineer that our machinery and works were sufficiently advanced to meet the requirements of that Act. By the provisions of that Act, as you are probably aware, the parishes appoint inspectors, and the gas delivered by us to the public is obliged to be of a certain illuminating power, and of a high degree of purity. I am very glad to say that throughout the whole of the half year the reports of these inspectors thus appointed by the parishes, and who are thoroughly independent of us, have been of a very satisfactory character. They have, in every instance, reported that the gas was of a higher illuminating power than required by the Act of Parliament, and in all other respects equal to the standard prescribed to us. (Hear, hear.) In the second paragraph of the report, we state that we are about to lay down some larger mains. It may not seem to you of much importance that we should report to you, considering our large district, that we are about to increase the size of our main to Poplar; but, gentlemen, it is to such additions as these made to your works during past years—the replacing of small mains by others of larger capacity—that we owe, in no small degree, the profits that we now make. By such means, we have been enabled to reduce the general pressure throughout the district, and correspondingly to reduce the amount of unaccounted-for gas. In proportion as we have thus been enabled to reduce the leakage, we have secured great advantages in reference to the income of the company. Last year, we reported to you that the unaccounted-for gas was 18½ per cent. I am glad now to be able to tell you that it has been, during this half year, brought down to 12½ per cent. (Hear, hear.) Now, it is a most important thing that we should be able to reduce the amount of our unaccounted-for gas to so small a figure. I remember that, many years ago, when our mains were much smaller, and the pressure was double what it is now, the amount of the unaccounted-for gas was something extraordinary. Gentlemen, the very difference is paying you a dividend. I merely mention this by way of explanation; because, though it may

seem a small thing that we should report that a further extension of mains of an increased size for the supply of gas to the Isle of Dogs has become necessary, yet, really, in the result it is so important that it is desirable you should take it into your consideration. The next paragraph in the report refers to the system adopted in the payment of the company's dividends. You will remember that, on some former occasions, the inquiry has been made by honourable proprietors whether we could not adopt the same system, or a somewhat similar one to that adopted by railway companies, in order to save our shareholders the trouble of coming to the office to receive the cheques for their dividends. We are now in a position to do so; we have money in hand to pay you all, and, therefore, after giving the subject our most serious consideration, we have thought that the time has arrived when we may carry out the suggestion offered, and forward cheques to you by post for the amount. There will, therefore, as the report informs you, be a resolution submitted to the meeting on the subject, which it will be for you to discuss; and, if you approve it, and authorize us accordingly, we shall have much pleasure in carrying it out. (Hear, hear.) Now, gentlemen, to refer for one moment to my remarks upon the first paragraph. I told you that inspectors had been appointed, who had reported favourably upon the quality of the gas supplied by us, and this saves me the trouble, and you the time, which would be taken up by going into any of those details that we have been accustomed to lay before you. I think the general result you can carry away with you. You will feel satisfied with the working of the half year when you learn that parties independent of the company have, from time to time, favourably reported upon its operations; and those who have been connected with us from an early period of our history, will see that the company is now placed upon such a basis that they have good reason to be proud of its position. (Hear, hear.) We owe a great deal of this to the ability, talent, and energy of our engineer. (Hear, hear.) All the reports which he has made to us we have endeavoured to carry out, and we have done so greatly to your advantage and his credit. Gentlemen, I will not detain you longer with any further remarks. I shall be happy to hear any observations you may desire to make, and to answer such questions as you may think it necessary to propose. I will now simply move that the report and accounts be received, approved, and entered on the minutes.

Mr. RHODES: I second the motion.

Mr. SAMUELS: In the number of shares issued, I see there are 2/5 and 1/10, and 1/5 and 1/10, making £6. 10. I cannot exactly understand it.

The CHAIRMAN: Those are not paid up, and that will account for the difference. They belong to a person who is not in a position to pay.

Mr. SAMUELS: The last issue of shares, I believe, was *pro rata*. Are there any left which have not been taken up?

The SECRETARY: Yes; 67—4/5, 1/10, and 1/20.

Mr. BOX: I am glad to hear that the directors are replacing small mains with large ones, to meet the requirements of the public. I believe with the chairman, that this will, in a great measure, go to reduce the unaccounted-for gas. I was glad, also, to hear the chairman lay so much stress upon the importance of looking after this point. When I first came into the concern, I believe it was four times what it is now. I have no doubt Mr. Jones is correct in this matter, though he and I do not always agree as to the mode of taking it. He includes all the gas consumed upon the works, which I do not. I consider the report presented to-day is a very favourable one, and I have great pleasure in supporting the motion for its adoption. There is one remark, however, I wish to make. I do not see anything in the accounts under the heading of "bad debts." Are we guaranteed against such contingencies? because, if we are, it is a most fortunate thing for the company.

The CHAIRMAN: We are not insured against loss in that way. It does not appear in our balance-sheet, because the amount has been deducted before the accounts were made up. If it is any information to the meeting, I may state that our bad debts amount to 1½ per cent., which, upon a large rental like ours, is not an extraordinary rate. (Hear, hear.)

The motion was then put and carried.

The Chairman of the company (Charles Salisbury Butler, Esq., M.P.) having entered the room, Mr. Wilson resigned his seat. Mr. Butler, after apologizing for his inability to be present at the commencement of the proceedings, moved the next resolution—viz.: "That from and after this date, cheques for the amount of the dividend be forwarded by post to the shareholders, except in those cases in which, in the judgment of the board, by reason of notice to the contrary, or of letters being returned, it is inexpedient to do so."

Mr. LULHAM: I second the motion. I believe it is the best course to be adopted, and is in conformity with the practice of most large companies.

Mr. BOX: Could not arrangements be made to pay the proprietors present at the half-yearly meetings before they leave? (No, no.)

The CHAIRMAN: I think it could scarcely be done. We should have to bring our books down here.

Mr. BOX: I have no wish to press the suggestion, the feeling of the meeting being against it.

The motion was then put and carried.

The CHAIRMAN: The next resolution is—"That, pursuant to the recommendation of the board of directors, a dividend at the rate of 5 per cent. for the half year ending the 31st of December last be now declared, and that cheques for the same be forwarded to the shareholders on Tuesday, the 15th instant."

Mr. RHODES seconded the motion, which was carried.

The retiring directors, Messrs. Butler, Wilson, and Beeton, were severally re-elected.

The CHAIRMAN: Gentlemen, on my own behalf, I beg to assure you that I am deeply indebted for your kindness. It is a matter of gratification to be re-elected, and to be re-elected in so cordial and unanimous a manner. This is not the first time by many that I have had to thank you for the expression of your confidence and approval. I feel that I have become a very aged director of your company, for I can look back to twenty-five or twenty-six years of service on the board, during the greater portion of which time I have been honoured by the possession of the chair; and, therefore, it is a very gratifying circumstance to know that I still retain the confidence of so many kind and good friends.

The DEPUTY-CHAIRMAN: Gentlemen, for the kind and unanimous manner in which you have re-elected me, accept my thanks. I am only a year younger than my friend in the chair, as far as my connexion with the company is concerned, having been elected twenty-four or twenty-five years ago. We have worked together with the greatest cordiality, and I think this is the sixth or seventh time we have come before you for re-election. We shall continue as we have done to labour together for the prosperity of the company; and I trust that, for many future years, we shall have the pleasure of meeting you under as favourable circumstances as we do at the present time.

Mr. BEETON, having returned thanks, the retiring auditor, Mr. Jones, was re-elected.

Mr. LULHAM: I think, gentlemen, that our directors, by their tact and talent for business, have proved themselves worthy of our best thanks, and I have much pleasure in moving—"That the best thanks of the meeting be given to the chairman and board of directors for the able and efficient manner in which they have conducted the business of the company."

Mr. RHODES seconded the motion, which was cordially agreed to.

The CHAIRMAN: Gentlemen, I again assure you—this time on behalf of my colleagues and myself—that we are deeply sensible of your kindness. In reference to my brother directors, I can only say that I do not know how I should manage to get on if I were not so ably supported by them as I frankly own I am upon every occasion. We are a mixed board; some of us have professional and other engagements in different parts of the metropolis, and I need scarcely remind you how important it is that there should be some bond of union between the directors of a public company and the district over which they exercise control. We are happy to say that it is so with us, and, though it does necessarily involve a great amount of labour by those directors who are living among the consumers, yet there are great advantages derived by the company from such a state of things. I do assure you that, if it were not for the devotion of so much time on the part of my colleagues, I for one could not manage to get on so well as I do. On their behalf, and my own, I acknowledge your kindness again to-day, and assure you that we shall go to work with renewed vigour after such an expression of your approbation, and I hope that when we meet you again we shall have as satisfactory a state of things to bring under your notice as we have had on this occasion.

Mr. GRAY: Before we separate, I think an acknowledgment of our thanks is due to our excellent engineer. (Hear, hear.) The deputy chairman stated to us in his address, how much he felt the success of the operations of the company depended upon the admirable conduct of the works by Mr. Jones. Every gentleman present must know that it is of the utmost importance to the welfare of such a company that the engineer should be a clever, persevering, and energetic man, and I think Mr. Jones has shown that he possesses these qualities, and many other equally valuable ones, and therefore I have great pleasure in moving a vote of thanks to him.

The CHAIRMAN: I cordially second this resolution, which my friend Mr. Rhodes had risen to do, because I think I ought to say a word or two in reference to it, for no one can be, or ought to be, so conversant with the affairs of a company as the chief officer in the chair. I assure you that Mr. Jones is most devoted to your interests, that the day is not too long, and that no detail to weary his energy is too trivial to enlist his attention. I do not know whether before I came into the room the deputy chairman said anything about the extraordinary reduction in the unaccounted-for gas. It is something prodigious, that in such a district as ours, where the mains are so extended, and at such varied levels, and where the distribution is so unequal, that our unaccounted-for gas should be reduced to something under 13 per cent. I know that Mr. Jones's attention is constantly directed to this subject; it is a point upon which his heart is set, and, whenever he succeeds in effecting a further reduction, I can assure you he is in the highest spirits. I might detain you for half an hour if it were necessary in speaking of his services, but it is not; at the same time, I could not let the resolution pass without saying so much, and I may add that this is the unanimous view of my colleagues. We not only entertain the feeling that he is a valuable and efficient officer—we look upon him with regard and friendship as a really good man—a man devoted to your interests, a man who could never do an improper or shabby act. (Hear, hear.) It elevates the company in the district over which we exercise control, that its chief officer should be a man of integrity and high standing. It is a source of extreme gratification for me to say so, because I am able to work so well with him. There was a time when I was not able to work so well with the officers of the company. I am now relieved of a great burthen, because I feel that I can depend upon my right arm. I am much obliged to my friend, Mr. Gray, of the City Gas Company, for proposing this resolution, because he is so well able to judge of the merits of a gentleman like Mr. Jones. And I also thank Mr. Rhodes, who is, perhaps, one of the largest holders of gas property in the room, and is, therefore, able to form a correct estimate of the position of a company, and of the means by which its success is secured. I am happy to shake Mr. Jones by the hand, and to assure him that he has the esteem of the directors as well as the proprietors at large.

Mr. JONES: Gentlemen, I feel greatly flattered as you may well suppose with the very high terms of approbation in which Mr. Gray has spoken of me, because I know he is so well fitted to judge what a man is capable of doing as a gas engineer. I, also, feel grateful for the way in which the chairman has referred to my services, and the way in which you have responded to the vote of thanks to me. I am a man of very few words, indeed, and, therefore, you must excuse my saying more than that I highly appreciate the confidence placed in me by the board. I thank them for the kindness with which they have always spoken of me and you for the very flattering way in which you have now expressed your approval of my conduct. (Hear, hear.)

On the motion of Mr. LULHAM, seconded by Mr. BOX, votes of thanks were passed to the auditors and secretary, which, having been acknowledged, the proceedings terminated.

IMPERIAL GAS COMPANY.

The Ordinary Half-Yearly Meeting of the Proprietors of this Company was held on Thursday last, April 10, at the Offices of the Company, John Street, Bedford Row—JAMES ST. GEORGE BURKE, Esq., governor, in the chair.

Mr. A. J. DUFF FILER (secretary, *pro tem.*) read the notice convening the meeting, and the seal of the company having been duly affixed to the register of proprietors, the following report was read:—

Your directors have to report that all the operations alluded to in their last report as advancing towards completion, have since been finished, and your works at the several stations, as well as the distributing power throughout the extensive districts lighted by the company, have been placed in a state of great efficiency, and were found fully equal to all demands for gas during the past winter.

That the West London Extension Railway Company have completed their line of railway from Kensington past your Fulham station of works; and, as soon as the siding into the works is made, you will have the advantage of both railway and water communication to those works, which, together with other improvements effected there, will render that station one of the most complete of its kind.

That, before your next meeting, the directors may find it necessary to raise further capital to meet the outlay for the ensuing winter, which it may be desirable to do by the issue of debentures, and they now ask your sanction to raise a further sum of not exceeding £50,000 by that means, if they should prefer it to making a call.

That the net profits for the half year, added to the balance of last account, will enable you to pay a dividend at the rate of 10 per cent. per annum, on the share capital of the company, and leave £2768. 3s. 11d. to be carried forward to the next account.

The directors, therefore, recommend that a dividend for the half year, ending the 31st of December last, be declared at the rate of 50s. per share upon the old shares, and 35s. per share upon the new shares less income-tax, and that the same be payable on and after this day.

That the existence and responsibility of the several sureties to all bonds for the

performance of offices of trust under the company, have been inquired into, and new bonds ordered to be taken where necessary, agreeably to the 8th bye law.

That, pursuant to the powers vested in them by the Act of Parliament, they have elected Mr. George Elliot to fill the vacancy in the direction, occasioned by the lamented death of Mr. James M'Mahon, and that, pursuant to the provisions of the Act, four directors and one auditor go out of office by efflux of time, and, being eligible, offer themselves for re-election.

It is with deep sorrow that your directors have to report the recent death of your much valued secretary, Mr. Alexander Henry, who, for thirty-four years, held that responsible office, and they deem it only a just tribute to his memory to express the high sense they entertained of his great intelligence, efficiency, and unvarying honourable conduct; also, of the constant and unwearied zeal and industry displayed by him during that long period, in the discharge of his duties, which they consider contributed greatly to the prosperity of the company.

The CHAIRMAN, in moving the adoption of the report, referred to the arrangements made for the distribution of gas during the past winter, which he stated, had proved highly satisfactory. The West London Extension Railway, having now completed their line from Kensington past the Fulham station, would give to the Imperial Gas Company, when the siding was completed, both railway and water communication with their Fulham works; from which the company expected to derive substantial advantages. It might be found necessary before the next meeting to raise additional capital to meet the outlay which must be made, in order to put the company in a position to comply with the demands for gas during the next winter. For this purpose, the directors proposed to ask the proprietors to sanction the raising of a sum not exceeding £50,000, either by debentures or call, as to the directors should seem most expedient. The profits of the past half year, added to the undivided balance, would enable the company to pay a dividend at the rate of 10 per cent. per annum, leaving a sum of £2768. 3s. 11d. to be carried to the next account. This dividend, on the report stated, the directors recommended. It was with sincere and deep regret he had to allude to the decease of their late secretary, Mr. Henry, who, for so many years, rendered such valuable service to the company; and a resolution would be proposed upon that subject, which, he felt sure, would meet with the unanimous approval of the proprietors.

Mr. E. V. RICHARDS (deputy-governor) seconded the motion, which passed unanimously.

A resolution authorizing the payment of a dividend at the rate of 50s. per share upon the old shares, and 35s. upon the new shares, less income-tax, passed unanimously.

A resolution authorizing the directors to raise the sum of £50,000 by debentures or call, passed *nem. dis.*

Upon the motion of Mr. SILVER, a director, seconded by Mr. JOHN BOX, a proprietor, it was unanimously resolved—"That, in consideration of the long and efficient services rendered to the company by their late secretary, Mr. Henry, and in testimony of the general esteem in which he was held by the proprietors, the directors are hereby authorized to continue to Mr. Henry's family, for the period of one year from the 1st of March last, the salary which would, during that period, have become payable to him. And that this resolution be communicated to Mr. Henry's family, with the expression of the sincere sympathy of the proprietors in the loss which they have sustained by his death."

The retiring directors, Charles William Christie, Esq., Lewis Cubitt, Esq., Robert Temple Frere, Esq., Joseph Pugh, Esq., and Thomas Yates, Esq., auditor, were unanimously re-elected.

A vote of thanks to the directors terminated the proceedings.

LONDON GAS COMPANY.

The Half-Yearly Meeting of Proprietors, was held at the Freemasons' Tavern, Great Queen Street, Lincoln's Inn Fields, on Tuesday last, the 15th inst.—EDWARD HAWKINS, Esq., the governor, in the chair.

The following report and statement of accounts were taken as read:—

Your directors submit to you the half-yearly accounts, showing the result of the manufacture and distribution of the company's gas up to the 31st day of December last; a copy of the balance-sheet, and a statement of the profit and loss for the past half year are annexed to this report. It will be seen that, after appropriating £750 to the redemption-fund, in accordance with the provisions of the London Gaslight Act, 1857, the sum of £25,121. 18s. 11d. remains applicable to dividend. Out of that sum, the dividends upon all classes of preference shares and stock will be paid on and after the 16th inst; and the directors recommend that a dividend of £1. 15s. per share, being at the rate of 7 per cent. per annum, be paid upon the ordinary shares which were paid up in full on or before the 31st day of December last.

It will be observed that the receipts for gas are little more than £300 in excess of those of the corresponding previous half year. If the average increase had taken place, that excess would not have been less than £3500. The consumption of gas has diminished in the thickly-populated trading districts, where there is no space for new buildings; and the increased consumption in such districts as Chelsea and Battersea has but little more than covered the loss sustained in the others. This state of things is not peculiar to this company. All, or nearly all, the metropolitan gas companies have been similarly affected, according to the nature of their respective districts. The diminution of consumption is probably due to the improved quality of the gas, the earlier closing of shops, the unusual brightness of the winter, and the economy consequent upon depression of trade. In all other respects, the half year has been most satisfactory, and the profits realized would have justified the directors in recommending an increase of dividend, had they not thought it right to look forward to the probable results of the current half year. These results will be affected by the increase of rating upon our property, by the fall in the price obtainable since Christmas for coke, and by the expense of altering the positions of main-pipes, with the object of still further improving the distribution and lessening the loss of gas from leakage; a process from which great benefit has already been obtained. On the other hand, there are several items upon which there will be an increase of revenue, but not sufficient to counterbalance the loss from the causes above enumerated. From the apparent check in the demand for gas, no credit has been taken in the above estimate for any improvement which may occur in the gas-rental. It has been the policy of this company so to deal with its earnings as to gain the confidence of the shareholders and of the public in the stability of the dividend; and the value of that confidence is testified by the proportionally high price which our shares bear. The directors are now pursuing the same policy in their recommendation to await the result of another half year before increasing the rate of dividend. So soon as the economy of consumers shall have reached its limits, or the depression of trade shall have ceased, or the barracks, railway-stations, and other large establishments springing up in our outlying districts, shall be so far complete as to require a full supply of gas, our rental will again advance in its former ratio; and with it, we may confidently look forward to the rapid increase of dividend to which we have lately been accustomed.

Arrangements have been made for enlarging the area of supply across the Thames to an extent which will be sufficient to meet the requirements of the company for many years.

Steady progress is being made towards adapting our new works at Nine Elms to meet all demands upon our manufacturing power at such time as, from the termination of our lease, we shall be obliged to abandon our leasehold works at Vauxhall. During the coming summer, a tar-tank will be constructed of ample capacity; the river front will be embanked, thus gaining a valuable piece of land; and a wharf wall will be completed to the canal for barges, which runs from the river to the very extremity of our new works.

In compliance with the wish of the shareholders expressed at the last general meeting, the usual form of the report has been altered by the addition of the balance-sheet, and of the names of the directors.

Two directors—namely, William Lee Wright, Esq., and George Hallett, Esq., retire by rotation, and, being eligible, offer themselves for re-election. One auditor—namely, George Pearson, Esq., retires also by rotation, and, being eligible, offers himself for re-election.

Dr. *Balance-Sheet, December 31, 1861.* *Cr.*

To 7673 shares			£383,650	0	0		
5519 first preference ditto			137,975	0	0		
			£521,625	0	0		
Debenture stock			32,472	0	0		
						£554,097	0 0
Loans						100,930	0 0
Trade and other debts						29,097	18 4
Unpaid dividends			£1,522	7	1		
Interest on Shares, 1845			383	7	11		
						1,905	15 0
Contingent-fund						6,100	9 11
Redemption-fund						502	13 0
Balance of profit, viz.—							
From previous half year			£22,641	9	5		
Half-year ending Dec. 31, 1861			20,094	6	11		
			£42,735	16	4		
Dividends, Oct. 15, 1861—							
Preference shares		£8,213	5	0			
Debenture Stocks		911	7	5			
Ordinary shares		8,489	5	0			
			17,613	17	5		
						25,121	18 11
						£717,755	15 2

By Plant						£593,289	8 10
Meters in use						17,088	12 9
Goods and products in store						12,040	2 8
Amount to receive on shares						3,335	5 3
Ditto owing for gas			£46,085	8	10		
Ditto owing for coke, &c.			3,884	2	10		
Ditto owing for house-rent			1,725	1	8		
Ditto owing for sundries			3,383	10	8		
						55,078	4 0
Cash in hand						4,452	1 8
Amount of debenture stock, as per contra						32,472	0 0
						£717,755	15 2

Dr. *Profit and Loss, for the Half Year ending December 31, 1861.* *Cr.*

To Coals						£29,175	16 7
Wages						8,509	6 2
Tradesmen's accounts						6,092	15 0
Meters—repairing and fixing						941	12 0
Directory and auditing						800	0 0
Salaries						1,748	3 0
Rates and taxes						1,327	9 6
Rents						872	18 6
Commission						742	4 10
Stationery, printing, and books of account						109	14 9
Incidental expenses						677	17 5
Allowances and bad debts						859	9 5
Law expenses						500	0 0
Gas supplied by other companies						28	0 8
On account of F. C. Hills' arrears for royalty						400	0 0
Depreciation						7,985	6 2
Balance						23,404	2 11
						£84,174	16 11
Interest on borrowed money						£2,559	16 0
Redemption-fund						750	0 0
Balance						20,094	6 11
						£23,404	2 11

By Gas						£65,528	18 6
Coke and other products						18,069	14 1
Rents						576	4 4
						£84,174	16 11
Balance brought down						£23,404	2 11
						£23,404	2 11

Dr. *Dividend-Fund.* *Cr.*

To Amount of preference shares dividend, Oct. 15, 1861			£8,213	5	0		
Ditto debenture stocks			911	7	5		
Ditto ordinary shares			8,489	5	0		
						£17,613	17 5
Balance						25,121	18 11
						£42,735	16 4

By Surplus profits, June 30, 1861						£22,641	9 5
Balance as above						20,094	6 11
						£42,735	16 4

The CHAIRMAN: Gentlemen, in moving the adoption of the report, I would remark that as the publication of the balance-sheet is entirely new to this company, and as probably few only of the shareholders may be acquainted with the nature of some of the items it contains, it may be well that I should briefly refer to them. You will see on each side of the account that the debenture stock is mentioned. That debenture stock was stock created by the capitalizing of the arrears of dividends upon the blue and red shares. You are most of you aware that a fund has been created by Act of Parliament, for paying off the debenture stock in the course of time. The amount which you see on both sides of the balance-sheet, viz., £32,472 is the sum which still remains unpaid on this head, but it must be understood that though that sum remains unpaid, we have, in addition to paying off a portion of the debenture stock, to pay off certain blue and red preference shares, so that the amount actually paid off is much larger than appears by these accounts. I believe our shareholders know what the contingent-fund consists of, and, also, what the redemption-fund is, and it will probably, therefore, not be necessary to refer further to the balance-sheet. Should any shareholder desire additional information, I will give it on learning that such is the case. The profit and loss account is the same as usual, and it will not be necessary to advert to that, but I will come at once to the more interesting portions of the report. Doubtless the shareholders will be anxious chiefly to know what we are doing at our new works at Nine Elms, in order to provide for carrying on the business of the company, when our lease at Vauxhall terminates. Plans have been made by our engineers for the whole of the works which will ultimately be erected there. Each year we are doing something towards carrying out those plans. This year, we are about to build a very large tar-tank, which will hold the whole of the tar produced on our works for some weeks. I mean, it will hold the whole tar produce of the works, for the heaviest weeks during the winter. We are also building wharfwalls, and, in other respects, preparing the works for the uninterrupted prosecution of the business of the company. We can predict to you with certainty that by the time our lease terminates, we shall have—as we ought to have, being the last erected—at Nine Elms, the finest works in existence. Now, we come to the profits of the half year. We have informed you, in the report, that those profits would enable us to pay a larger dividend than we have recommended to you. We have also stated in the report the reasons why we have not recommended the payment of a higher rate. Looking forward, we see that there will be a considerable falling off in the amount to be obtained for coke, tar, and other products; and we do not see anything on the other side of the account which will make up for the effect of this falling off. We know, too, how very much depends upon keeping our dividends perfectly stable; we know that the value of our shares has been extremely high in the market, principally from the entire faith which our shareholders and the public have that our dividends will be continued at least at the usual rate. If you adopt the scheme we have recommended in the report, we can confidently assure you that next half year you will certainly receive 7 per cent., and probably more. We believe it will only be necessary for you to exercise a little patience until the present depression of trade has ceased, and those consumers who are now economizing will undoubtedly resume their consumption, and we shall obtain new customers, when you may fairly anticipate an improvement in this respect. The moment our rental begins to increase, it will increase in a larger ratio than it has hitherto done, and, with that increase of revenue, our profits will be considerably augmented. I do not know that it is necessary I should say more. The report is so full, that it will enable all our proprietors to understand what we are doing, and to judge of the value of their share in the concern. With these remarks, I beg to move—"That the report now laid before you be received and adopted."

Mr. RHODES seconded the motion, and inquired respecting the loans, whether it was the intention of the directors to reduce the amount below £100,930?

The CHAIRMAN said, the company were authorized by Act of Parliament to borrow £91,000. They were also authorized to issue £150,000 first preference shares; and, in addition to the £91,000 which they could borrow, they were allowed to have as a debt so much of the £150,000 of preference-share capital as they had not raised. The amount which appeared as a debt in the balance-sheet was considerably within their powers. Probably, either as they issued the first preference shares, or accumulated money for the redemption-fund, they might pay off their bonds—he did not say that they would do so.

Mr. RHODES inquired, whether the £593,289 for plant included the cost of the leasehold property at Vauxhall?

The CHAIRMAN said, it included all the property of the company of every kind, both at Vauxhall and Nine Elms. It must, however, be recollected that the latter was in substitution for the former; therefore, the value of plant would not be increased by what was built at Nine Elms.

Mr. RHODES asked, what kind of shares those were which appeared not to be paid up?

The CHAIRMAN said, the amount to receive on shares was an amount due entirely upon the ordinary shares issued in 1845, and which the holders had not hitherto thought it worth while to pay up. In answer to further questions from the honourable proprietor, the chairman said, in all probability the parochial rating of the company would be much increased. The directors would not willingly submit to larger assessments, but he was afraid they would have to pay more than they did at present. In reference to the item of law costs, probably the amount charged for the future, instead of being, as for some time it had been, £500, would only be the current expenses of the half year under that head. The total amount originally due to Mr. Hills was £2400, and the company had been paying it off at the rate of £400 each half year, and this charge would have to be continued for the next two years.

Mr. SLEE asked what was done with those shareholders, in reference to dividends, whose shares were not paid up?

The CHAIRMAN said, they received nothing until the shares were paid up in full.

Mr. SLEE asked whether the falling off in the coke returns, to which the chairman had alluded, was a probable, or only a possible, result?

The CHAIRMAN said it was a certainty. The falling off for the first three months warranted him in saying it would be at least £2400 this half year.

Mr. PRICE said he had pleasure in acknowledging the readiness with which the board had met the suggestion he made, on the last occasion, to print the balance-sheet, and append the names of the directors and officers of the company to the report. He felt that this information was very essential to the shareholders, and that it was calculated to inspire confidence in the concern, when the names of those who managed their affairs were made public. He wished to know whether the red and blue shareholders had become ordinary stockholders?

The CHAIRMAN said, certain of them had, in pursuance of their power, converted their shares in that way; but, by far the largest number had not done so. In answer to further questions, the chairman said, the dividends of of the red and blue shareholders were limited by Act of Parliament to 6 per cent.; while the dividends payable to the black, or ordinary shareholders, varied according to the profits of the company. There was no objection, as the 7673 ordinary shares did not stand on the same footing, with regard to dividend, as the 5519 preference shares, to put them under a separate heading in the balance-sheet. The redemption-fund arose in this way. At the time the company capitalized the arrears of dividend on the red and blue shares at the rate of 10s. in the pound, Lord Redesdale insisted upon a clause being inserted in the Act of Parliament, the operation of which was, that an amount of stock, equal to the stock then created, would ultimately be paid off. It was not thought right that that stock so created should permanently remain a charge upon the company, because there was no capital expended to represent it. Under that clause, the directors set apart every year, out of the profits of the company, the sum of £1500, which was applied either in redemption of debt, or of preference or ordinary shares; and the debt, or shares so redeemed, ceased to exist for ever. The directors had not thought it right to use the fund for the purpose of redeeming bonds, because that would have destroyed their borrowing power to that extent, but in the redemption of blue or rod preference shares or stock. The sum of £502. 13s., which, by the balance-sheet, appeared to the credit of the redemption-fund, was that portion of the £1500 so laid aside, and not yet applied to this purpose. The contingent-fund consisted of the sum of £6100, and was applied to the usual purpose of meeting any extraordinary outlay.

Mr. PRICE said, he should like to know what it had hitherto been applied to? This was the first time he had seen it in the aggregate. There had never been any deficiency of dividend to make up, but there had always been a surplus.

The CHAIRMAN said, the surplus profits, after meeting the dividends, had gone to the dividend-fund, and still remained in it. The contingent-fund had had very considerable sums carried to it, which had been applied during many years to meet extraordinary demands upon the company. A large portion of the expense of their action with the Imperial Company was paid out of it. The £6100 was the sum still remaining to the credit of that fund.

Mr. PRICE referred to the item of law expenses, £500. During the last four half years, £3604 had been charged under this head—one half year it was £2104. Was it that the company had some old costs to discharge, or that a certain sum was appropriated by the directors as an inducement to go to law?

The CHAIRMAN said, law was not a luxury which the directors were fond of. The truth was, that the legal expenses had been extremely heavy, and it was thought better to appropriate a sum in this way each half year rather than to charge the whole against profits in any one account. It would be a satisfaction to the shareholders to know that at the present moment the whole arrears of law expenses were paid off. He did not mean to say that the company were entirely free from all legal difficulties; there was yet one matter to be settled, which might or might not involve expense, but, up to the present time, all the charges upon that fund had been disposed of.

Mr. PRICE said the dividend on preference shares for the half year ending June, 1861, was £8273. 5s., and for the half year ending December last, it amounted to £8213. 5s.—a difference of £60. Did that arise from the redemption of a portion of those shares?

The CHAIRMAN said, it arose partly from redemption and partly from the conversion of blue into ordinary shares.

Mr. PRICE said, he now came to the question of the depreciation-fund. He found that, since he became a shareholder in 1860, they had laid by £7577 for the half year ending June of that year; £7584 in December; £8105 in June, 1861; and now, £7985, making together, £31,251. On a previous occasion, the chairman informed him that the object of this fund was to replace the cost of their works at Vauxhall, and that they had erected or were erecting other works at Nine Elms, more convenient in every respect. He (Mr. Price) then stated it as his conviction, though he could not get the chairman to agree with him, that all the company were required to do, irrespective of what an accountant or the Act of Parliament might say, was to put themselves in as good a position in their new works with regard to plant as they had been in the old. The answer of the chairman was, that they ought to lay by exactly what the works at Vauxhall cost. Now, if, as he believed, the works at Nine Elms though involving less outlay, were more convenient for the operations of the company, they were not required to lay by any sum of money beyond that which was necessary to meet this expenditure. He felt the importance of this, because, by the Metropolis Gas Act, they were authorized, before making a reduction in the price of gas, not only to pay to the shareholders a 10 per cent. dividend, if the profits of any half year permitted, but also to make up dividends for a certain number of years back, which had been less than that amount. It was, therefore, very much to the advantage of the shareholders that they should immediately avail themselves of that provision, for the simple reason that the longer they delayed it, the less power would they have to make up the arrears of those periods when the company were able only to pay small dividends. If they did not now embrace the opportunity, they would in a few years only have to supplement 6 and 7 per cent. dividends; whereas, if they adopted the course he would recommend, they would have to supplement dividends of 2 and 3 per cent. He was far from wishing to starve the works, or in any way to cripple the resources of the company's business; but, seeing that by their contingent and redemption-funds they were continually lessening their capital, and, therefore, would have a less amount to pay dividends upon, he thought they ought to content themselves by limiting the depreciation-fund to the sum actually required to replace the Vauxhall works, and not extend it to the amount which those works originally cost. He looked to his own pocket in the matter to see that he had full value for his shares, and contended that his successors had no right to expect him to lay by money for them. He hoped the directors would take the matter into their consideration, and give the shareholders reason to suppose that it would not be necessary to go beyond the amount actually required for the new works at Nine Elms. He also wished to be informed the result of a negotiation which he saw had been going on between the board and the South-Western Railway Company, who, it appeared, intended to take a portion of this company's freehold land at the new works.

The CHAIRMAN said he hoped the matter last referred to would be amicably settled in a few days. With regard to the other matter, the honourable proprietor had rightly apprehended the nature of the observations made from the chair on the last occasion, except in one particular. The whole of the depreciation-fund was not laid aside to meet the expenses incurred by the falling in of the lease of the Vauxhall property. Every half year, £5000 was reserved for that purpose—in other respects, the depreciation-fund of this company was less than was usually the case. He (the chairman) certainly did hold the opinion (which was shared in by his colleagues) that it would be right to reserve not only sufficient to construct the works at Nine Elms, but the amount which the Vauxhall property cost—or, at all events, the great proportion of it—although, as had been properly observed, the new works would be more efficient and valuable in all respects. But, though the thing might be legitimate, the question arose whether it was expedient; and, in such a case as the present, he thought the directors were bound to show not

only that it was right in the abstract, but that there was good policy in it. Unfortunately, the company had exhausted the whole of their capital, and could only look to the amount which, from time to time, they saved out of profits to meet the necessary extension of their works. Upon these extensions depended the increase of their rental, to which increase alone they could look for augmentation of dividends. They had a right to save profits as a depreciation-fund; and, but for that fund, must meet the calls for extensions out of the current dividends of the proprietors. It would not be politic to apply to Parliament to raise fresh capital, as already their capital was too large; and, in all probability, if they obtained leave to increase it, the Legislature would, as it was accustomed to do, impose more severe conditions than they were at present under; and it must be remembered that dividends would have to be paid upon any addition to the capital. So that, looking at the present condition and future prospects of the company, he thought the course adopted by the directors was by far the most prudent. With reference to the Act of Parliament, no doubt much might be said upon the clause which the honourable proprietor alluded to. That clause was drawn to suit the position of most companies, but it did not meet the position of the London Company. There was no provision made in the Act for large depreciation, and the existence of works upon leasehold property. This company was an exception to most of the other companies in the metropolis, and they would find it very difficult to work under the clause which had been referred to.

Mr. RILEY said, as the preference shares were now at a premium, he thought it would be better for the directors to apply the redemption-fund, not in the purchase of such shares, but in paying off the bonds of the company.

The CHAIRMAN said, the board had not hitherto purchased any preference shares at a premium. They had been fortunate in buying blue and red shares before they were at par, and had largely purchased blue and red stock. They had power to redeem their bonds at par; but, as a great portion of their debentures were at 4½ per cent., and some probably would be at 4 per cent., it might be expedient to give something more than par to redeem 6 per cent. shares, leaving the borrowing powers of the company intact.

Mr. RILEY said, he approved of the policy of the board in reference to the depreciation-fund. It appeared to him that their predecessors had made no provision for the destruction of the property of the company at the end of their lease, instead of laying by a sufficient sum year by year to meet the growing depreciation in it. They had no right to divide anything until the assets of the company were restored. No doubt the board had good reason for not reserving the whole amount which would be necessary to replace the capital expended at Vauxhall before the termination of the lease: their not doing so was a concession to the policy of the honourable proprietor (Mr. Price); but he hoped the proprietors generally would support the board until every farthing which ought to be in existence was restored by the depreciation-fund. As to the power given by the Metropolis Gas Act, to recoup themselves for deficient dividends in past years, he hoped the board would not exercise it until they were in a position to give the shareholders 10 per cent. upon the current half year.

Mr. BESLEY differed entirely from the last speaker as to the policy of the depreciation-fund being maintained until the capital of the company expended at Vauxhall was replaced. He thought they ought to go upon the purely commercial principle of dividing among existing shareholders the whole of the profits earned in each half year.

The CHAIRMAN said, if the board had adopted that course, they would be obliged to report to the shareholders that next half year the existing rate of dividend could not be continued. It was only by taking out of the profits of the last half year that they could hope to continue that rate of dividend in the present. With regard to the policy of appropriating any profits to the account of dividends in arrear, he would only say that that course had been taken by another company, and had been by some persons censured, and by others approved. Before it was done in this company, the directors would have to consider the matter very carefully. But he must remind the proprietors of what was meant by profits in this company. If they had read over the two last reports of the directors, or the account of the proceedings at the meetings of the company as given in the JOURNAL OF GAS LIGHTING, they would see it had been most distinctly stated that, in fact, they had no profits at all, supposing their accounts were submitted to an accountant, because profits could only come after a valuation of their plant from the beginning to the end. Their plant had depreciated during the past and many previous half years, and would do so for many half years to come, more than the amount of the profits of those half years; and it was only by making that statement to the shareholders that they could legitimately divide anything. If they divided what was not strictly and legally a profit with the consent of the shareholders, and the knowledge of the world, they were committing no fraud, and deceiving no one.

Mr. PRICE said, in the profit and loss account there was an item of tradesmen's bills, £6012. 15s.; but, there were no items, as in previous accounts, for wear and tear and purifying materials.

The CHAIRMAN said, the Directors were trying to assimilate their accounts in form to those of other companies, and, in doing so, had included wear and tear and purifying materials in tradesmen's accounts. In reference to a remark by Mr. Besley, he observed that the directors never considered whether the course they took would increase the value of shares to-day or to-morrow. They felt that the interests of the proprietors at large were committed to them, and that the value of the concern would be enhanced by taking a comprehensive view of things, and providing for the future, instead of dividing, from time to time, the whole of the profits as they were earned.

After some further conversation, the motion for the adoption of the report was put and carried unanimously.

The retiring directors, Messrs. Wright and Hallett, and the retiring auditor, Mr. Pearson, were severally re-elected, and, on the motion of Mr. PRICE, seconded by Mr. RHODES, a vote of thanks to the directors was cordially adopted.

The CHAIRMAN, on his own behalf and for his colleagues, acknowledged the vote.

Thanks having been given to the auditors, the proceedings terminated.

SURREY CONSUMERS GAS COMPANY.

The Half-Yearly Ordinary General Meeting of the Shareholders of this Company was held at the Bridge House Hotel, Wellington Street, Southwark, on Thursday, the 17th of April—W. B. JAMES, Esq., in the chair.

The SECRETARY (Mr. W. P. Boddy) read the notice convening the meeting, and the seal of the company was affixed to the register of proprietors.

The following report and statement of accounts were then submitted:—

The accounts for the six months, ending Dec. 31 last, herewith subjoined, exhibit the customary items of receipt and expenditure.

The balance of unappropriated profits, which appeared in former balance-sheets, has been transferred to the credit of the works account, the amount representing that balance having been expended in the extension of works.

It will be seen that the net profit for the half year amounts to £6875. 2s. 5d., out of which the directors recommend the payment of the usual dividend at the rate of 8 per cent., clear of income-tax, which will amount to £6168. 8s. 6d.

Mr. Croll's contract terminated on the 1st of January, on which day he surrendered possession of the works. Since then, the operations of the company have progressed satisfactorily, and the directors entertain no doubt that, when the resources of the company are fully developed, the change will be productive of great advantage.

The directors have been advised by their engineer that it will be necessary to renew a portion of the retorts, in order to prepare for the next winter's supply of gas; and, while it is their anxious desire to limit all expenditure to that which is absolutely necessary, they, at the same time, are not unmindful of the importance of placing the works in a condition to meet the requirements of the public service.

The directors who retire on this occasion are Mr. W. B. James and Mr. Stephenson Clarke; both of whom, being eligible, offer themselves for re-election.

The auditor who retires from office is Mr. W. Bagshaw; and, being eligible for re-election, offers himself accordingly.

Dr. *Balance-Sheet, to December 31, 1861.* *Cr.*

To Capital account—				By Land works, plant, and machinery	£156,512	5 5
Shares	£150,000	0 0		Deptford works	20,648	16 0
Amount unpaid	6	0 0		Offices and office furniture	1,704	10 1
	£149,994	0 0			£178,865	11 6
Creditors on bonds	34,900	0 0		Sundry debtors	9,079	8 6
Sundry creditors	2,960	19 11		Deposit, bearing interest	5,000	0 0
Dividends unpaid	148	14 4		Cash balance—		
Balance of profit	6,875	2 5		General account	£1,784	19 4
				Dividend ditto	148	17 4
					1,933	16 8
	£194,878	16 8			£194,878	16 8

Dr. *Revenue Account, for the Six Months ending December 31, 1861.* *Cr.*

To Amount due for rental	£8,474	0 7		By Directors allowances	£ 400	0 0
Premium on sale and allotment of 234 shares	704	3 9		Salary of secretary and clerks	173	3 1
Transfer fees	3	7 6		Rents and taxes, including income-tax	400	16 0
Old stores	12	4 1		Stationery, printing, and general charges	154	11 0
				Payment to auditors	15	15 0
				Repairs of premises	2	9 0
				Restoring surfaces of roads after laying pipes	100	0 3
				Restoring and replacing meters	137	15 0
				Additional meters	57	17 10
				Law charges	57	17 8
				Interest paid from profits on borrowed capital	818	8 8
				Balance for shareholders profit	6,875	2 5
	£9,193	15 11			£9,193	15 11

I certify this account to be correct.

WM. P. BODDY, *Secretary.*
W. B. JAMES, *Chairman.*

The CHAIRMAN: Gentlemen, in moving the adoption of the report and accounts, I may observe that the balance-sheet this day presented to you is very much the same as on previous occasions, and, therefore, it will hardly be necessary to detain you with any explanations respecting it. There is one difference in it, which is, that the unappropriated profits which have always appeared as an item in the balance-sheet, having been expended in the extension of the works, are written off the works account, and will not appear there any more. With that observation, I will dismiss the subject of the balance-sheet, as you have already seen and read it; and I will proceed at once to those topics which I am quite sure, to-day, are of more interest to you—viz., the termination of Mr. Croll's contract, the appointment of our new engineer, and the operations of the company during the last quarter. You will recollect that the committee of investigation, appointed last year, entered into certain arrangements with Mr. Croll, in reference to the transfer of the works of the company at the termination of the lease last December. On the report of that committee coming before you, the task was deputed to your directors of carrying out the arrangements which they recommended. Your directors nominated several gentlemen of high standing in their profession, for Mr. Croll to select one from as referee, in whose hands the matter was to be left, and by whom all questions between him and the company were to be decided. Amongst the gentlemen so named was Mr. Robert Jones, of the Commercial Gas Company, a gentleman of very high standing, and great reputation in his profession, and the engineer of one of the large metropolitan gas companies. Mr. Croll accepted the nomination of Mr. Jones, and that gentleman proceeded with the reference made to him. Under his direction, Mr. Croll carried out such repairs as were considered necessary. Your directors felt that the company were entitled to expect from Mr. Croll a fair return for the very generous and liberal treatment which he had always received from them during the period of his contract. Mr. Jones reported to the directors—and, I think Mr. Croll is entitled to the benefit and credit of that report—that Mr. Croll had properly performed his contract, and that the works had been fairly used. (Hear, hear.) He also stated in his report that Mr. Croll's expressions to him towards the company were generous and candid, and that, in every respect, his conduct was

straightforward and honourable. (Hear, hear.) Gentlemen, the duty imposed upon your directors of appointing an engineer for the company in the place of Mr. Croll was a very anxious one. They advertised their intention to make the appointment, and a large number of gentlemen of great respectability and talent applied for the office. Out of the number, your directors unanimously elected Mr. Henry Finlay, who had been for nine years connected, as assistant engineer, with the Commercial Gas Company. That is a company with a rental, I believe, of £100,000 a year; a gigantic company, therefore, compared with ours, but with a district very similar in character; and the directors thought that, in his connexion with it, Mr. Finlay had had a good opportunity of acquiring a practical knowledge of his profession. I am sure I am speaking the opinion of my colleagues when I say that Mr. Finlay has already, in the successful management of the company's operations during the past quarter, fully justified his appointment, and reflected credit on the gentleman who recommended him, and the board by whom he was selected. (Hear, hear.) Your directors feel strongly that nothing should ever be stated from this chair but what is a realized and ascertained fact, and that it is very wrong to anticipate what may be the balance-sheet which next half year will be presented to you, because there is always a great deal of risk and liability with a gas company. We see sometimes that serious accidents occur—there is one recorded in the newspapers to-day; and there are other contingencies which arise and affect the position and prospects of such undertakings. But, inasmuch as you must be most anxious to know what has been the result of the company's operations in the quarter ending the 31st of March last, I am instructed by the directors to state to you that they find the rental has increased during that period to the extent of nearly £600, which is a larger increase than has been known for some time past. I am also authorized to state, that the operations of the company have been most successful, and that we believe we shall on the 30th of June be in possession of a considerable sum of money, applicable to the purposes of the company, after paying the dividend of 8 per cent. to the shareholders, and discharging all the debts and obligations upon us. I beg you most distinctly to understand that I am not now holding out to you any hope of an increased dividend. That surplus money in hand will probably be required to be applied to the works, in order to put them in a position to render the public service perfectly secure. You will observe, in looking at the balance-sheet, that we have arrived at the end of our capital, and at the limit of our borrowing powers, within a few pounds. It is impossible for a gas company in the metropolis, or, indeed, in any place, to retain its position without having the means of raising money, should it from time to time become necessary; and, therefore, I am instructed, while telling you of the successful operations of the company under the conduct of our new engineer, to inform you that we shall have, in all probability at no remote period, to apply for an Act of Parliament to enable us to increase our capital. I need not tell you that the directors will not resort to that course so long as they have money in their possession which will be sufficient to put the works in a condition to supply the requirements of our district, as required by the Legislature. We have entered into a coal contract with Messrs. Ridley, of Newcastle, and I am authorized by our engineer to say that it secures to us a supply of coals on very advantageous terms. You know that coals are the stable commodity of the company, and that, upon the rate at which we purchase that commodity, depends the profit that we can make. Our works are most excellently situated for that purpose, and, in that respect, we possess advantages which, perhaps, no other company in the metropolis possess, in getting coals to the mouth of the retort. Our engineer authorizes me also to say that the quality of the coals is very satisfactory. You will probably have observed that Dr. Vinen's report has recently proved that the gas we are supplying is all that could be desired, there being an entire absence of sulphuretted hydrogen and ammonia; while the illuminating power is 20 per cent. above the parliamentary standard. We have perfected, as desired by the shareholders, a set of bye-laws, to control the operations of the directors. Those bye-laws it is not necessary to bring before you, but they are upon the table, if any shareholder desires to look over them. We have also prepared a set of bye-laws for regulating these meetings, which will presently be read by the secretary. Of course, since we have taken the works into our own hands, there has been a great increase in the duties which your secretary has had to perform. We have, therefore, thought it right to add to his salary the sum of £100; and it will be necessary, in accordance with the Companies Clauses Consolidation Act, to ask you at this meeting to approve of that addition. The labours of the directors, I also think it right to inform you, have considerably increased: we have now very anxious duties to perform. There are three committees appointed: the parliamentary committee, the rota committee, and the committee of conference, which is composed of gentlemen living within the district, and whose duty it is to act in case of any emergency. These committees have been attending to the various duties assigned to them for some time past gratuitously. I believe I have now completed the budget I had to bring before you; and there is, I think, nothing else that it concerns you to know. I have only, in conclusion, to congratulate you that the works are in our own hands, and that our operations have been placed upon a substantial basis. Whatever surplus profits there are now, we can apply to the purpose of the improvement of the works; or to dividends; or in reduction of the price of gas; and there is no longer any interest which interferes with the application of those profits. (Hear, hear.) I have now to move—"That the report of the directors be received and adopted; and that a dividend at the rate of 8 per cent. per annum be now declared, and payable, free of income-tax, on and after the 28th of April, inst."

Dr. LIDDELL: I have much pleasure in seconding the motion, and in expressing my satisfaction with the report and the speech we have just heard. It is very pleasing to me to observe, as the chairman has stated, that the reports of Dr. Vinen show the quality of our gas is considerably improved; but I am bound to state that the burner which Dr. Vinen formerly used was not of the same kind as the one he uses now. The burner he used to employ represented the gas of the company considerably below its illuminating power. He has now introduced a burner which does more justice to it; and he has, I believe, received some important information from your engineer. I may say that there is not a more honourable man in the medical profession than Dr. Vinen; and I am persuaded that whatever errors he made were due to the particular kind of burner he used, and not to any intention on his part to understate the quality of the gas supplied by this company. Our gas is, as the chairman has told us, above the standard prescribed by the Metropolis Gas Act, and I believe it is equal to 38 per cent. above what we were required by our old Act to give. I am sure, from what I know of the metropolitan companies—and I have to test the gas of four at Whitechapel—that the public have every reason to be satisfied with the quality uniformly supplied to them at the present time. I am happy to say, also, that, having tested the gas of this company, I find it is second to none; and, whatever faults have been found by the public in past times—and they have been very numerous—the liberality with which the company is now dealing with their consumers is such as to justify their confidence and approval. The public must be aware that the expense of supplying a high illuminating power of gas is very considerable, and that the company might supply them with a much lower quality without being liable to any ground of complaint of being beneath the parliamentary standard. The directors, as I think very properly, are endeavouring to please their customers, because there can be no two interests between consumers and shareholders in a gas company; and I am sure, if the former are not satisfied, the latter will suffer. I should like to ask what is the per centage of leakage at the present time?

The CHAIRMAN: The engineer is not prepared to go into it.

Mr. BRICKHILL said, he joined in the congratulations of the chairman; but, he was afraid from one portion of his speech, that there was something looming in the future which was not of an agreeable character. On a former occasion, there was an expectation held out that the shareholders would soon receive a 10 per cent. dividend, or that there would be a reduction in the price of gas. Now, however, they were told that, though there would probably be a considerable surplus profit this half year, the amount would not be divided among the shareholders, but would be applied to the extension or improvement of the works, notwithstanding they had been informed that those works were in a very efficient state. He thought, if the present directors required any additional money, they might follow the good example of their predecessors, and borrow it upon their own responsibility.

The CHAIRMAN said, at the present time there were £2000 borrowed upon the personal security of the directors.

Mr. BRICKHILL said, he hoped the board would not be in a hurry to increase the capital of the company, because, if they began to do so, they would always find something to be done upon the works which would appear to justify fresh outlays.

The CHAIRMAN said, the directors had no desire to do so unnecessarily; but, they felt while laying before the proprietors the excellent prospects of the company, they ought not to withhold from them the information that, in all probability, additional capital would be required. His remarks were only intended to apprize them of what was in the future.

Mr. CHRISTIE entertained quite a different opinion on the subject to that expressed by Mr. Brickhill, and hoped the directors would not be crippled in their exertions for want of capital. It was rather a matter for congratulation that this company, along with the other metropolitan companies, felt that an increase was necessary, and, while they were able to give the shareholders a good dividend, there was no doubt the general feeling would be in favour of an augmentation of their resources, to meet the necessary development of their business.

Mr. BLAKE (a director) said, no one could know better than Mr. Brickhill the advantages which a tradesman possessed in being able to make his purchases with ready money. It was the strong, and, indeed, the single argument which the chairman of the Great Central employed, to induce the shareholders in that company to consent to an increase of capital, that it would afford the directors important advantages in making their coal contracts. It must be remembered, too, that the Surrey Consumers Company were building up a property for all time to come, and it was most essential that they should lay a solid foundation for the superstructure they were about to raise. When the accounts, now before the meeting, were made up, the directors had £5000 at deposit bearing interest, but that sum had since been consumed in erecting a gasholder and tank at Deptford. This was an absolutely necessary expenditure, and would have to be followed by others, and, therefore, there could be no doubt the board would, ultimately, have to ask the shareholders to approve of a proposal to increase the capital of the concern, as the chairman had intimated.

After some further conversation, the motion was put and carried unanimously.

Mr. RIGG, having referred at some length to the duties of the directors, proposed that the allowance to the board be increased from £800 to £1200 per annum.

The CHAIRMAN said the directors were greatly obliged to Mr. Rigg for the manner in which he had expressed his appreciation of their services, but they would prefer that his motion should not be pressed upon the acceptance of the shareholders until they had had more experience of the results of the new arrangements of the company.

Mr. RIGG, upon that intimation, withdrew his proposal.

Mr. WHITE (an ex-director) said, if the motion had been persisted in, he should have had pleasure in seconding it; for he felt that the present remuneration of the board, considering the amount of services they rendered to the company, was not sufficient.

The retiring directors, Messrs. James and Clarke, and the retiring auditor, Mr. Bagshaw, were re-elected.

Mr. BODDY, the secretary, read the shareholders' bye-laws, which gave rise to some discussion.

Dr. LIDDELL suggested the addition of a bye-law regulating the mode of filling up vacancies at the board, and another providing that the remuneration to the directors should not be increased without previous notice.

Mr. FRANKLIN said there was no necessity for deciding the question on that occasion, and he would second the proposition which had been made in the course of conversation, to adjourn the consideration of them until the next meeting; and that, in the meantime, they be printed and circulated among the shareholders.

Dr. LIDDELL consented to this arrangement, and the chairman promised that the board would consider the points to which he had drawn attention.

A formal resolution approving of the increase in the secretary's salary was then adopted; and, on the motion of Mr. NEWMAN, seconded by Mr. BRICKHILL, a vote of thanks was given to the chairman and directors.

The CHAIRMAN acknowledged the vote, and the proceedings terminated.

METROPOLIS GAS SUPPLY.

WESTMINSTER DISTRICT BOARD OF WORKS.

A meeting of this board was held on Friday the 11th of April—Mr. THOMAS HORN in the chair—which was made special for the purpose of considering the propriety of rescinding, varying, altering, or amending the resolution of the board of the 31st of May 1861, with reference to the expenses incurred in passing the Metropolis Gas Act, 1860.

Mr. GODSON, in accordance with previous notice, moved the following resolution—"That the resolution of this board, passed the 31st of May, 1861, having reference to the expenses incurred in passing 'The Gas (Metropolis) Act, 1860,' be varied, altered, amended, or rescinded, so as to meet the existing circumstances having relation thereto, whereby all further litigation and delay may be avoided, and the better to enable the Metropolitan Board of Works to pay, and this board to accept a sum of £161. 1s. 10d. in full discharge of the sum of £200, contributed by this board towards the expense of obtaining such Act, and to prevent such sum of £161. 1s. 10d. being wholly lost to this board by further delay and probable litigation."

Mr. HARTLEY seconded the motion, which gave rise to some conversation. Upon a show of hands, the motion was negatived.

Mr. JEBB, the clerk, referring to the correspondence with the board since the last meeting, said he had received a letter from the Metropolitan Board upon the subject of the resolution adopted by this board at the last sitting, not to concur in the proposal for the settlement of the Metropolis Gas Act charges as recommended in Mr. Beal's circular to the various district boards and vestries. Mr. Pollard, the clerk to the Metropolitan Board, had written to him to the effect, that he had laid before the Metropolitan Board, at their meeting on the 29th of March, the letter from the Westminster Board, stating that the circular received from Mr. Beal on the subject had been under their consideration, and, after some considerable discussion, they had not concurred in the resolution proposed by Mr. Beal, for a settlement of the costs. Upon the reading of such letter, it having been stated by Mr. Hughes, the representative of the district board, that no resolution to that effect had been passed by them, and that the communication in question was wholly unauthorized, the Metropolitan Board adjourned the further consideration of the letter, and directed him to communicate to Mr. Jebb, for the information of the district board, the purport of Mr. Hughes's statement. Mr. Pollard also intimated that the further consideration of the letter would be resumed on the following Friday, when he should be happy to lay before the Metropolitan Board any further communication which he (Mr. Jebb) might be directed to make on the subject.

The minutes of the board were read and the JOURNAL OF GAS LIGHTING, containing the report of the proceedings at their last meeting, the 14th of March, was referred to. After a long conversation on the subject, it was moved by Mr. SHEDLOCK, seconded by Mr. RIDLEY, and carried with one dissentient—"That this board approve of the course taken by the clerk to the board, in regard to the circular received from Mr. Beal, as to the settlement of the costs incurred in relation to the Metropolitan Gas Act, and that Mr. Hughes laboured under a misapprehension when he made the statement at the Metropolitan Board on the 29th of March last."

It was also further resolved—"That a copy of the foregoing resolution be forwarded to the Metropolitan Board of Works."

SALE OF GAS ACT.

CITY OF LONDON QUARTER SESSIONS.

The Magistrates and Justices of the Peace for the City of London assembled in Quarter Sessions at Guildhall on Saturday April 12—the Right Honourable the Lord Mayor presiding.

The Clerk of the Peace (Mr. S. R. Goodman) read the following report from the Committee of Magistrates appointed to carry out the provisions of the Sale of Gas Act in the City of London.

To the Magistrates of the Peace for the City of London in General Quarter Sessions assembled on Saturday, April 12, 1862.

Whereas, at the General Court of Session, holden for the City of London, on the 19th day of October last, an order of reference was made to a committee of the whole court of justices for them further to carry out the Act of Parliament for regulating measures used in sales of gas.

Your committee, in pursuance of the said order of reference, report—That they have received a communication from the Metropolitan Board of Works, enclosing an opinion of Sir William Atherton, the Attorney-General, and Mr. Gray, upon a case submitted by them to the effect—That, by section 1 of the Act 24 and 25 Vict. cap. 79, the powers conferred on the justices of this City by the gas measurement Act were transferred from them and vested in the Board of Works.

Your committee, immediately upon the receipt of that letter, placed themselves in communication with the Government, who directed a case to be prepared and submitted to those gentlemen, in conjunction with Sir Roundell Palmer, the Solicitor-General. The result of this further deliberation was, that in January last the Government forwarded to the Lord Mayor the opinion upon the case last submitted to counsel, in which it was stated that the powers of the justices of the City of London were not transferred to the Metropolitan Board of Works, but remained in full force and virtue in the justices of the City of London.

While this subject was under consideration, the Commissioners of Sewers objected to obey the order of the Court of Quarter Session, and Messrs. Parkinson and Co., with whom your committee had incurred a debt amounting to £385. 19s. 3d., were pressing for payment of their account, and your committee then passed a resolution to allow them 5 per cent. per annum upon that amount from the 5th of August last, your committee having no funds at their disposal out of which to defray the claim.

Your committee further report, that they have conferred with a deputation from the Commissioners of Sewers, who, since the receipt of the last opinion of counsel, agree with your committee as to the mode of carrying the Act into effect, and who have since obeyed all the orders made upon them accordingly.

With respect to the salary of Mr. Frederick Taunton, the late inspector of gas-meters, the Commissioners of Sewers entered into an arrangement with him by which he received £250 in discharge of all claims for services rendered by him.

Your committee further report, that, from the 12th day of August last (the commencement of operations at the gas-office) up to and inclusive of the 5th of April instant, 39,818 meters have been tested and stamped there, and fees for the same, amounting to the sum of £1242. 15s., have been received; of which sum, £704. 15s. 6d., being the fees received up to and inclusive of the 28th of December, 1861, have been paid to the Chamberlain as treasurer of this City, to the account of the Commissioners of Sewers, and the balance, £537. 19s. 6d., the fees received from that date up to and inclusive of the 5th of April inst., will be paid to the same account.

By an order of the Court of Quarter Session made on the 19th day of October last, the inspector of gas-meters is directed to pay quarterly to the Chamberlain all fees received by him during that time. Your committee recommend that that order be rescinded and an order made in lieu thereof, directing him to pay weekly to the Chamberlain all fees received by him.

Your committee further report that they have approved of a form of application to be made to the Commissioners of Sewers by the inspector of gas-meters, for the payment weekly of the wages of his assistants, and submit the same for the sanction and approval of the court.

Your committee further report that a communication has been received from Lord Monteagle, the Comptroller-General of the Exchequer, announcing the completion of the standard gasholders, prepared for the use of this City (to be kept by the Lord Mayor for the purpose of testing the gasholders of all England) in conformity with the said Act, and recommending that Messrs. Bryan Donkin and Co., the makers of the instruments (which are of great value), be employed in their removal to, and erection at, the gas office in Whitecross Street. In pursuance of that recommendation, your committee authorized Messrs. Donkin and Co. to remove the gasholders; and, upon the arrival of the same at the gas office, Messrs. Donkin reported that the room prepared for the reception of the standards was not of sufficient size for the proper working of the same, and submitted to your committee a plan for the alteration and enlargement of the room, which plan your committee have adopted, and ordered to be carried out with as little delay as possible, under the superintendence of the City architect, Messrs. Donkin, and Mr. Sporne, and which said works are now nearly completed.

Your committee further report that they have necessarily incurred the following expenses in carrying out the requirements of the said Act:—

	£	s.	d.
Great Central Gas Consumers Company, for gas	65	17	3
Mr. E. Lyne Hancock, for gas-tubing	19	0	2
Messrs. Parkinson, interest, and for gas-burners	15	2	10
Wages of the assistants employed at the gas office, from Oct. 19, 1861, to April 12, 1862, and balance of inspector's salary	136	6	8
Mr. Youle, clerk to the justices, disbursements for water-rates, Exchequer stamps, and petty cash	14	3	2
Mr. Gravatt, for sealing-wax, stationery, &c.	12	13	9

Your committee submit to the court the proceedings which have been taken by them, in pursuance of the said order of reference, and recommend that orders be made by the court, in pursuance of the said Act, upon the Commissioners of Sewers, for the payment of the several expenses incurred by them as aforesaid.

Dated the 11th day of April, 1862.

(Signed) SAMUEL WILSON.
THOMAS CHALLIS.
F. G. MOON.

On the motion of Alderman WILSON, seconded by Alderman GIBBONS, the report was received, and approved.

It was also resolved that an order be forthwith made by the court upon the Commissioners of Sewers, for the payment of the several accounts referred to by the committee in their report.

It was further resolved that, from and after the 12th of April, the inspector of gas-meters appointed by this court, in pursuance of the Statute, be directed to pay over weekly to the Chamberlain of the City of London, on account of the Commissioners of Sewers, all fees received by him.

The court approved and adopted the form of application to the Commissioners of Sewers for the payment of the wages of the inspector's assistants.

DR. J. NORTHCOTE VINEN'S REPORT ON THE GAS SUPPLIED BY THE SURREY CONSUMERS COMPANY:—

1862. Week ending.	Number of Observations.	Maximum Light. Candles.	Minimum Light. Candles.	Average Light. Candles.
April 5	4	15·10	12·56	14·04
„ 12	4	16·82	14·04	15·19

The volume of hydrocarbons averaged 4·25 per cent.; carbonic acid, 1 per cent.; sulphuretted hydrogen, none. There was a slight trace of ammonia on the 10th; none was detected on any other day. On the 10th of the month, the gas was tested at the works, Rotherhithe, when the illuminating power was found to be equal to 14·68 candles.

AUSTRALIAN GAS COMPANY, SYDNEY.—The Half-Yearly Meeting of the Australian Gaslight Company was held on Feb. 19, at the Company's Office—the Hon. JAMES MITCHELL, Esq., in the chair. The report was read by the secretary, and unanimously adopted. A dividend of 5 per cent. was declared for the half year, with a bonus of 2½ per cent. Mr. J. L. Montefiore was elected a director in the room of Sir Charles Nicholson, bart., who has gone to England. The report stated that since the previous general meeting, the second gasholder at the Haymarket station had been completed, and brought into effective operation, and that the company are now in a position to supply gas to the whole of the suburbs of Sydney, so far as the consumption would give an adequate return. The company had reduced the price of gas, and the charge for hire of meters, from the commencement of the present year; the reductions being, on gas consumed by meter, 2s. per 1000 feet, or from 15s. to 13s. per 1000; on inside lights burnt by contract, 10 per cent.; corporation lights, and those for suburban municipalities, from £10 to £9 per light per annum; and, on the charge for hire of meters, about 24 per cent. It was mentioned in the report that, in order that the quality of the company's gas might be ascertained by competent and disinterested investigation, the directors had engaged Mr. Charles Watt, of the Sydney University, to make experiments thereon from time to time, and report the results arrived at. Mr. Watt had already sent in three reports, all of which were very satisfactory, showing that, as regards both specific gravity and illuminating power, the company's gas was equal to the average of that made in England. —*Sydney Morning Herald, Feb.* 10.

Advertisements.

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Share List of Gas Companies.

(Directors and Managers of Gas-Works are earnestly requested to enable us to rectify any errors and fill up the omissions in the following List.)

The Companies whose names are printed in italic type are incorporated by Act of Parliament.

No. of Shares issued.	Amount per Share.	Name of Company.	Amount paid up per Share.	Div. per Cent. per Annum.	Price per Share.
	£	**ENGLAND.**	£ s d	£ s d	£ s d
360	5	Aberavon (Lim.).	5 0 0	6 0 0	5 0 0
		Aberdare.			
		Abergavenny			
400	5	Abergele (Lim.).	5 0 0	4 0 0	5 0 0
		Aberystwith			
530	10	Abingdon	10 0 0	6 0 0 & Bns. of £3.	12 0 0
1050	10	*Accrington Gas & Water*	10 0 0		15 0 0
1050	10	Do., new shares.	10 0 0		15 0 0
2100	5	Do., do.	5 0 0		7 10 0
2100	5	Do., do.	1 0 0		1 10 0
2100	2½	Do., do.	0 10 0		0 15 0
1200	5	Airdale (Limited).	5 0 0	10 0 0	8 10 0
300	5	Do., new shares.	0 10 0	8 0 0	
24	75	Alcester	75 0 0	4 0 0	80 0 0
128	10	Aldborough (Lim.)	10 0 0	5 0 0	
300	6	Alfreton	6 0 0	5 0 0	5 10 0
		Alnwick			
		Alston Moor			
250	10	Alton	10 0 0	10 0 0	12 0 0
1600	5	Altrincham	5 0 0	6 0 0	6 0 0
		Amersham			
170	10	Ampthill	10 0 0	4 0 0	9 0 0
350	10⅜	Andover	10 12 6	6 0 0	12 10 0
358	5	Appleby	5 0 0	2 10 0	2 15 0
230	10½	Arundel	10 10 0	10 0 0	10 10 0
250	10	Ashbourne, Derby.	10 0 0	6 0 0	13 10 0
292	5	Ashburton	5 0 0	5 0 0	
84	30	Ashby-de-la-Zouch	30 0 0	6 0 0	
700	10	Ashford (Limited), Kent	10 0 0	6 0 0	11 10 0
1600	30	*Ashton-und-Lyne.*	30 0 0	10 0 0	60 0 0
590	5	Atherstone	5 0 0	9 0 0	8 10 0
		Attleborough			
		Axminster			
200	20	Aylesbury	20 0 0	5 0 0	21 0 0
150	10	Aylsham (Limited), Norfolk	10 0 0	5 0 0	12 10 0
3093	10	*Bacup (Rossendale Union)* ordinary	10 0 0	9 0 0 & Bns.	18 0 0
600	10	Do., preference.	10 0 0	9 0 0	18 0 0
2597	10	Do., new issue	4 0 0	9 0 0	8 0 0
		Bakewell			
200	10	Baldock	10 0 0	5 0 0	10 0 0
1000	10	Banbury (Limited)	10 0 0	7 10 0	15 0 0
2150	10	*Bangor Gas & Wr.*	10 0 0	5 0 0	10 0 0
		Barmouth (L) £1500			
260	10	Barnard Castle	10 0 0	5 10 0	10 15 0
800	5	Barnet	5 0 0	6 0 0	5 10 0
		Barnsley £6000		7 10 0	
109	20	Barnstaple	20 0 0	7 10 0	
1158	2	Barton-on-Humber.	2 0 0	& Bns. 5 0 0	2 0 0
120	25	Basingstoke	25 0 0	8 0 0	30 to 34
2500	16	*Bath*, A shares.	16 0 0	8 0 0	} 38 0 0
2500	8	Do., B shares.	8 0 0	7 0 0	} united
2500	10	Do., C shares.	8 0 0	7 0 0	12 0 0
		Battle £2000		6 0 0	
56	26⅔	Bawtry	26 12 6	6 0 0	25 0 0
		Beaminster			
710	10	*Beccles Gas & Wr.*	10 0 0	2 10 0	
		Bedale, Yorkshire.			
300	30	Bedford	25 0 0	4 0 0	20 0 0
350	10	Bedworth	10 0 0	7 0 0	11 10 0
300	3	Belford	3 0 0		1 10 0
350	10	Belper	10 0 0	10 0 0	14 0 0
		Berkeley			
		Berkhampstead			
1086	10	Berwick & Tweedmouth	10 0 0	7 0 0	13 10 0
120	20	Bewdley	16 0 0	5 0 0	16 0 0
200	10	Bicester	10 0 0	5 10 0	11 0 0
330	10	Bideford	10 0 0	6 0 0	10 10 0
		Biggleswade			
		Billericay			
5000	5	*Bilston*	5 0 0	8 0 0	7 12 6
200	10	Bingham	10 0 0	4 0 0	
		Bingley £7400		4 0 0	
1200	80	*Birmingham*, A sh.	80 0 0	9 0 0	145 to 147
400	8	Do., B shares.	8 0 0	9 0 0	14½ to 15
2500	40	Do., new shares.	40 0 0	7 10 0	60½ to 61½
2400	50	*Birmnghm. & Staff.*	50 0 0	10 0 0	100 0 0
2400	25	Do., new shares.	25 0 0	10 0 0	50 0 0
7020	20	Do., do.	20 0 0	10 0 0	40 0 0
12500	28	Do., do.	1 0 0	7 10 0	4 2 6
250	16	Birstall	12 0 0	12*s.* 6*d.* per sh.	12 0 0
		Bishop's Auckland			
180	10	Bishop's Castle	10 0 0	5 0 0	10 0 0
230	10	Bishop's Stortford	10 0 0	5 0 0	10 0 0
6000	15	*Blackburn*, A sh.	15 0 0	9 0 0	27 0 0
6900	15	Do., B shares.	2 0 0	6 15 0	3 10 0
		Blaenavon G. & W.			
		Blandford			
		Blyth & Cowpen			
		Bodmin			
		Bognor			
100	10	Bolsover	10 0 0		10 0 0
3909	16⅔	*Bolton*	16 10 0	10 0 0	40 0 0
7466	16⅔	Do., new shares.	3 10 0	6 10 0	5 5 0
		Boroughbridge (Lim.) £15,000			
800	10	*Boston*	10 0 0	8 10 0	
1200	10	Do., new shares.		8 10 0	
200	5	Boughton Blean	5 0 0	5 0 0	5 0 0
193	10	Bourn	10 0 0	5 0 0	
		Bournemouth Gs. & Wr. (L) £10,000			
160	10	Brackley	10 0 0	6 0 0	10 0 0
		Bradford, Wilts			
	25	*Bradford, Yorkshire*	25 0 0	10 0 0	49 0 0
		Braintree			
		Brampton, Cumb.			
		Brandon, Suffolk			
575	10	Brecon (Limited)	10 0 0	10 0 0	17 0 0
897001	Sk.	*Brentford*	All.	5 10 0	100 0 0
1340	20	Do., preference	20 0 0	5 0 0	20 0 0
609	20	Do.	3 0 0	5 0 0	3 0 0
		Brentwood			
		Bridge, near Cant.			
		Bridge-end, Glam.			
		Bridgnrth(L) £5600			
200	50	*Bridgwater*	50 0 0	7 0 0	50 0 0
400	10	Bridlington	10 0 0	7 10 0	12 10 0
450	10	Bridport	10 0 0	5 0 0	10 0 0
6000	5	*Brierly Hill*	5 0 0	4 0 0	5 2 6
		Brigg			
3375	20	*Brighton*	20 0 0	6 0 0 & Bns.	27 to 27½
4015	20	*Brighton & Hove*	20 0 0	6 0 0 & Bns.	26 0 0
		Brmscmbe. & Chalford. (L.) £3000			
191250	Sk.	*Bristol United*	Stock.	9 0 0	178 to 180
300	5	Briton-ferry	5 0 0		
150	8	Brixham	8 0 0	5 0 0	
		Broadstairs			
1000	5	Bromley, Kent	5 0 0	7 0 0	
		Bromsgrove			
100	10	Bromyard (Lim.)	10 0 0		
		Broughton			
120	10	Bruton	10 0 0	4 0 0	8 to 9
		Brynmawr			
100	25	Buckingham	25 0 0	6 0 0	26 to 27
		Buntingford (Lim.)			
500	1	Burley-in-Wharfdale (Limited)	1 0 0	5 0 0	1 1 0
		Burnham, Somers.			
1600	5	*Burslem & Tunstll.*	5 0 0	10 0 0	9 0 0
2240	5	Do., new shares.	5 0 0	7 10 0	7 0 0
		Burton in Kendal			
1200	10	*Bury St. Edmd's*	10 0 0	10 0 0	17 10 0
1800	10	Do., new shares.	1 10 0	10 0 0	
303	10	Buxton (Limited)	10 0 0	7 10 0	14 0 0
150	10	Caistor	10 0 0	7 0 0	12 0 0
187	5	Callington	5 0 0		5 0 0
215	10	Calne, Wilts	10 0 0	6 0 0	10 0 0
		Camborne			
600	50	*Cambridge*	50 0 0	10 0 0	90 0 0
160	12½	Do., new shares.	12 10 0	10 0 0	22 10 0
640	8½	Do., do.	4 0 0	10 0 0	6 0 0
240	50	*Canterbury Gas & Water*	50 0 0		56 0 0
240	25	Do., new shares.	25 0 0	} £6	28 0 0
240	12½	Do., do.	12 10 0		14 0 0
240	6¼	Do., do.	6 5 0		7 0 0
800	25	*Cardiff*, A shares.	25 0 0	10 0 0	42 0 0
800	25	Do., B shares.	25 0 0	8 0 0	38 0 0
160	25	Carmarthen	25 0 0	5 0 0	30 0 0
		Carnarvon			
		Carshalton			
200	6	Castlecary	6 0 0		5 0 0
200	10	Castle Donnington	10 0 0	6 0 0	12 14 0
249	5	Castleford	5 0 0	5 0 0	5 0 0
400	5	Castletwn, I. of M.	5 0 0	5 0 0	5¼ to 5½
620	2	Cawood (Limited)	2 0 0	4 0 0	
		Chatteris			
300	10	Cheadle	10 0 0	5 0 0	10 0 0
200	50	Chelmsford	50 0 0	8 0 0	70 0 0
200	25	Do., new shares.	25 0 0	8 0 0	35 0 0
2500	16	*Cheltenham*, A sh.	16 0 0	8 0 0	
2500	8	Do., B shares.	8 0 0	7 0 0	
		Do., new shares.		7 0 0	
500	10	*Chepstow*, A sh.			
200	10	Do., B shares.			
		Chertsey (*see* Co. & General, Lond)			
		Chertsey Consmrs. (Lim.) £3000.			
230	10	Chesham	10 0 0	5 0 0	10 10 0
80000*l*	Sk.	*Chester United*	Stock.	8 0 0	
24650*l*	,,	Do., preference	,,	7 0 0	140 0 0
535	10	Do., new shares.	2 10 0	7 0 0	3 10 0
250	5	Chester-le-Street	5 0 0	6 0 0	5 0 0
19200*l*	Sk.	*Chesterfield G. & W*		5 0 0	
400	50	Do., new shares.	50 0 0	5 0 0	52 0 0
		Chestertn.(L)£2000			
240	25	Chichester	25 0 0	6 0 0	31 10 0
		Chippenham			
329	10	Chipping Norton (Limited)	10 0 0	5 0 0	
100	10	Chipping Ongar	10 0 0	2 10 0	5 0 0
838	20	Chorley	20 0 0	7 0 0	27 0 0
		Chowbent, Lancashire			
		Christchurch			
200	5	Church Stretton (Limited)	5 0 0		
680	10	Cirencester	10 0 0	5 0 0	11 0 0
357	10	Cleckheaton, A sh.	10 0 0	5 0 0	
357	10	Do., B shares.	10 0 0	5 0 0	
350	10	Clevedon	10 0 0	4 10 0	10 0 0
		Clitheroe			
1132	5	Cockermouth	5 0 0	5 0 0	5 5 0
300	5	Coggeshall	5 0 0		4½ to 5
900	20	Colchester	20 0 0	7 0 0	24 0 0
		Coleford, Gloucester			
		Coleshill (L.) £2000			
160	10	Collingham (Lim.)	10 0 0	5 0 0	10 0 0
		Collumpton			
150	20	Colne, Lancashire	20 0 0		36 0 0
150	10	Do., ½ shares.	10 0 0	} £10	18 0 0
150	5	Do., ¼ shares.	5 0 0		9 0 0
150	5	Do., A shares.	5 0 0		9 0 0
150	5	Do., B shares.	5 0 0		9 0 0
150	5	Do., C shares.	2 0 0		5 0 0
		Congleton	25 0 0	5 0 0	31 0 0
320	5	Conway (Limited).	5 0 0		5 0 0
		Corsham			
1600	25	*Coventry*	25 0 0	8 0 0	35 0 0
	25	Do., new shares.	25 0 0	7 10 0	
200	10	Cowbridge	10 0 0	3 0 0	5 0 0
500	10	Cowes	10 0 0	5 0 0	
		Cradley Heath, nr. Dudley			
		Cranbrook. £1900		5 0 0	
		Crayford & Bexley			
420		Crediton	5 0 0	5 0 0	6 0 0
225	10	Crewkerne	10 0 0	3 0 0	10 0 0
		Cricklade(L.) £1000			
200	10	Croft & Hurworth-upon-Tees (Lim)	9 0 0		
1200	1	Crook (Limited)	1 0 0	10 0 0	1 5 0
251	5	Crowland	5 0 0	7 0 0	
181	10	Crowle, Lincoln	10 0 0	10 0 0	
4000	5	*Croydon Commrcl.*	5 0 0	10 0 0	10 0 0
		Cuckfield			
250	20	Dartford	20 0 0	7 0 0	27 0 0
700	5	Dartmouth (Lim.)	5 0 0	5 0 0	5 0 0
125	20	Daventry	20 0 0	5 0 0	24 8 0
165	10	Dawley	10 0 0	5 0 0	10 0 0
346	5	Dawlish	5 0 0	8 0 0	7 10 0
800	10	Deal & Walmer	10 0 0	5 0 0	10 0 0
1200	1	Deddington	1 0 0		
		Dedham (L.) £1000			
		Delph, Yorkshire			
500	6	Denbigh	6 0 0	5 0 0	6 0 0
1350	25	*Derby*	25 0 0	10 0 0	52 3 0
		Dereham			
7000	5	*Devonport*	5 0 0	8 0 0	8 12 6
3000	5	Do., preference	2 0 0	4 0 0	4 5 0
4000	5	*Dewsbury & Batley*	5 0 0	7 10 0	7 10 0
2000	5	Do., new shares.	3 0 0	7 10 0	
		Dolgelly			
160	10	Donnington	10 0 0	5 0 0	10 0 0
340	25	Dorchester	25 0 0	5 0 0	30 0 0
120	25	Dorking	24 0 0	5 0 0	25 0 0
		Dorrington, Linc.			
192	25	Douglas, I. of Man	25 0 0	8 0 0	30 0 0
21945*l*	Sk.	*Dover*	100 0 0	6 0 0	108 0 0
400	10	Do., new shares.	5 0 0	6 0 0	6 0 0
500	10	Dowlais (Limited).	10 0 0	8 0 0	12 0 0
25	60	Downham Market.	60 0 0	7 10 0	
		Driffield			
		Droitwich			
500	20	*Droylsden*	10 0 0		
600	30	*Dudley*	30 0 0	6 6 0	37 to 40
1500	20	*Dukinfield*	11 0 0	10 0 0	22 10 0
200	10	Dunmow	10 0 0	5 0 0	10 0 0
		Dunstable			
900	10	Durham	10 0 0	10 0 0	} £26
900	10	Do., new shares.	5 10 0	10 0 0	
250	10	Dursley, Glouestr.	9 0 0	6 0 0	9 5 0
150	5	Easingwold	5 0 0	5 0 0	
400	10	Eastbourne	10 0 0	5 0 0	11 0 0
90	20	East Dereham	20 0 0	5 0 0	21 0 0
356	5	East Grinstead	5 0 0	6 0 0	5 0 0
1200	5	East Retford	5 0 0	10 0 0	7 10 0
		Eckington & Mosboro' (L.) £2500			
		Egremont, Cumb.			
703	6½	*Elland*	6 10 0	8 0 0	10 0 0
800	5	Elsecar (Limited)	5 0 0	5 0 0	5 12 0
		Eltham			
200	10	Emsworth			
400	5	Enfield	5 0 0	5 0 0	5 0 0
300	19	Epsom & Ewell	19 0 0		
		Erith			
325	10	Eton—Cannel Gas (Limited)	10 0 0	5 0 0	10 0 0
700	10	Evesham (Lim.)	10 0 0	6 0 0	9½ to 10
1600	25	*Exeter*	25 0 0	8 0 0	40 to 42
250	10	Exmouth	10 0 0	5 0 0	10 0 0
58	25	Eye	25 0 0	5 0 0	25 0 0
170	10	Fairford	10 0 0	3 0 0	
		Fakenham(L)£3500			
100	38	Fareham	38 0 0	5 0 0	
120	25	Farnham	25 0 0	10 0 0	42 0 0
		Farnworth & Kearsley			
		Farringdon			
		Faversham			
		Fazeley (L.) £3000			
120	10	Fenny Stratford (Limited)	10 0 0	5 0 0	11 0 0
	5	Filey	5 0 0	5 0 0	5 0 0
300	10	Folkestone	10 0 0	10 0 0	15 0 0
240	10	Do., new shares.	8 0 0	10 0 0	13 0 0
280	5	Framlingham	5 0 0	5 0 0	5 10 0
1155	1	Frodsham (Lim.)	1 0 0	2 10 0	1 0 0
160	25	Frome	25 0 0	7 10 0	
160	25	Do., new shares.	20 0 0	7 10 0	
12000*l*	Sk.	*Gainsborough*	All	6 0 0	110 to 115
400	20	Do., new shares.	6 0 0	6 0 0	
170	10	Gillingham (Lim.) Dorset	10 0 0	3 0 0	
103	25	Glastonbury	25 0 0	4 0 0	15 0 0
600	10	*Glossop*	10 0 0	9 0 0	16 0 0
600	5	Do.	5 0 0	9 0 0	8 0 0
1800	10	Do., new shares.	6 10 0	7 10 0	8 10 0
1000	25	*Gloucester*, A sh.	25 0 0	10 0 0	41 0 0
856	25	Do., B shares.	18 15 0	7 10 0	23 15 0
260	20	Godalming	20 0 0	5 0 0	20 0 0
300	5	Do., new shares.	5 0 0	5 0 0	5 0 0
100	20	Do., do.	8 0 0		
100	5	Do., do.	2 0 0		
621	5	Gomersal	5 0 0	6 0 0	6 7 6
		Gorleston & Southdown			

No. of Shares issued.	Amount per Share.	Name of Company.	Amount paid up per Share.	Div. per Cent. per Annum.	Price per Share.
	£		£ s d	£ s d	£ s d
		Gosport			
450	20	Grantham	20 0 0	7 0 0	28 0 0
1000	20	Gravesend	20 0 0	5 0 0	21 0 0
		Grays Thurrock			
643	5	Gt. Berkhampstd.	5 0 0	6 0 0	5 10 0
1000	10	*Great Grimsby*	9 10 0	9 0 0	16 0 0
1000	6¼	Do., new shares	4 10 0	9 0 0	7 0 0
700	5	Great Harwood	5 0 0	4 5 0	
280	5	Do., new shares	1 0 0		
210	10	Great Marlow	10 0 0	5 0 0	10 0 0
		Great Torrington			
450	5	Great Wigston	5 0 0	6 0 0	
150	1	Do., new shares	1 0 0	6 0 0	
1300	10	Guernsey	9 0 0	8 15 0	18 0 0
352	25	*Guildford*, A sh.	25 0 0		
352	3	Do., B shares	3 0 0		
		Do., new shares			
		Guisborough			
240	5	Hadlow (Limited)	5 0 0		
140	10	Hailsham	10 0 0	6 0 0	10 0 0
40	50	Halesowen	50 0 0	6 0 0	
480	5	Halesworth	5 0 0	7 10 0	7 5 0
240	5	Haltwhistle (Lim.)	5 0 0	4 10 0	5 0 0
		Hampton			
1000	10	*Harrogate*	10 0 0	5 0 0	10 15 0
6800	5	*Hartlepool Gas & Water*	5 0 0	7 0 0	7 12 6
3322	5	Do., new shares	5 0 0	7 0 0	7 0 0
9878	5	Do., do.	1 10 0	7 0 0	
1000	1	Hartley Wintney, Hants	1 0 0	2 10 0	21s. to 23s.
		Harwich			
662	6	*Haslingden*	6 0 0	10 0 0	10 0 0
343	6	Do., A shares	4 0 0	10 0 0	6 0 0
1254	25	*Hastings & St. Leonard's*	25 0 0	8 0 0	
180	10	Hatfield			
		Harlow			
500	5	Havant	5 0 0	3 0 0	5 0 0
120	10	Haverhill	10 0 0	5 0 0	10 0 0
244	5	Haworth	5 0 0		5 5 0
		Hay, Brecon			
		Haydon Bridge			
4965	1	Hebden Bridge	1 0 0		
170	10	Heckington (Lim.)	10 0 0		10 0 0
120	10	Hedon (Limited)	10 0 0	3 0 0	
145	12	Helston	12 0 0	9 0 0	
250	10	Hemel Hempstead	10 0 0	4 0 0	7 0 0
300	10	Henley (Limited)	10 0 0		
		Hereford. £10,000		4 10 0	
300	10	Herne Bay	10 0 0	6 0 0	11 0 0
		Hertford			
		Hessle (L.) £1500.			
470	10	Hexham	10 0 0	8 0 0	14 0 0
400	25	*Heywood*	25 0 0	7 10 0	40 0 0
400	25	Do., new shares	25 0 0	7 10 0	37 10 0
160	10	Higham Ferrers	10 0 0	7 0 0	12 0 0
		Highworth, Wilts			
520	5	High Wycombe	5 0 0	6 0 0	6 16 0
300	10	Hinckley	10 0 0	7 10 0	10 0 0
600	5	Hindley, Lancash.	3 0 0		3 0 0
200	20	Hitchin	20 0 0	8 0 0	
200	5	Do., new shares	5 0 0	8 0 0	
		Hoddesden			
555	20	*Holmfirth*	19 0 0	5 0 0	19 0 0
960	5	Holyhead	5 0 0	6 0 0	6 2 6
		Holywell (*see* Brit. Provincial)			
98	25	Honiton	25 0 0	3 12 0	20 0 0
1250	1	Honley (Limited)	1 0 0	5 0 0	1 0 0
6	500	Horncastle	£500		
		Hornsey (Lim.)			
1200	2½	Horsforth	2 10 0		2 10 0
142	20	Horsham	20 0 0	10 0 0	25 0 0
	10	Houghton-le-Spg.	10 0 0	8 0 0	
		Howden			
1700	20	*Huddersfield*	20 0 0	10 0 0	37 5 0
250	20	Do., new shares	15 0 0	10 0 0	
		Hull			
		Hull-Sculcoates (*see* Brit. Prov.)			
210	10	Hungerford	10 0 0	5 0 0	10 0 0
860	10	Huntingdon & Godmanchester	10 0 0	4 0 0	10 0 0
		Hurstperpoint (Lim.) £1800.			
600	10	Huyton & Roby	10 0 0	6 0 0	11 0 0
2500	10	*Hyde*	9 0 0	5 10 0	10 15 0
400	10	Hythe & Sandgate (Limited)	10 0 0	6 0 0	10 15 0
		Idle & Eccleshill (*see* Airdale)			
		Ilford			
198	12	Ilfracombe	2 0 0	4 0 0	8 to 9
560	6¼	Ilkestone	6 5 0	11 4 0	8 0 0
		Ilkley			
		Ilminster			
250	5	Ingatestone (Lim.)	5 0 0	1 10 0	
2800	10	*Ipswich*	10 0 0	8 0 0	15 to 16
		Ironbridge			
180	10	Irthlingborough	10 0 0	5 0 0	10 0 0
800	25	*Isle of Thanet* (Margate & Ramsgate.)	20 0 0	5 0 0	31 to 33
		Jersey, St. Helier's			
363	5	Kelvedon (Lim.)	5 0 0		
1842	9	*Kendal Union Gas & Water*	9 0 0	7 0 0	12 10 0
380	20	Do., preference	20 0 0	7 10 0	35 0 0
290	10	Kenilworth (Lim.)	10 0 0	4 0 0	10 0 0
400	5	Keswick	5 0 0	5 0 0	4 0 0
200	25	Kettering	25 0 0	6 0	30 0 0
		Keynsham			
		Kidderminster, £10,000		5 0 0	
800	5	Kidsgrove	5 0 0	12 0 0	7 10 0
150	10	Kimbolton	10 0 0	7 0 0	12 0 0
140	7	Kingsbridge	7 0 0		10 to 11
270	5	King's Cliffe	5 0 0	5 10 0	5 0 0
		Kingstn-on-Thame			
		Kington, Hereford			
400	5	Kinver, Staffordsh.	5 0 0		5 0 0
		Kirby Lonsdale			
		Kirkburton			
330	5	Kirkham, Lanc.	5 0 0	4 0 0	5 0 0
330	2½	Do., new shares	2 10 0	4 0 0	2 10 0
200	10	Kirton-in-Lindsey (Limited)	10 0 0	5 0 0	10 10 0
200	5	Knighton	5 0 0		
1000	10	*Knottingley*			
470	31¼	*Lancaster*	31 10 0	7 2 10	45 to 46
470	6 gs.	Do.	6 6 0	7 2 10	9 to 9¼
564	15⅞	Do.	15 15 0	5 0 0	21 to 22
50	25	Langport	25 0 0	4 0 0	15 0 0
		Launceston			
		Lea Bridge (*see* Co. & Gen.)			
1000	20	*Leamington Priors*	20 0 0	8 0 0	25 0 0
250	20	Do., new shares	15 0 0	5 0 0	17 0 0
213	10	Leatherhead	10 0 0	5 0 0	10 0 0
		Ledbury			
		Leeds Old Comp—			
6030/7	Sk.	Old shares	£100	10 0 0	174 to 176
5000/7	,,	New do.	£100	6 0 0	113 to 114
3970	10	Do. do.	7 0 0	6 0 0	8¼ to 8¾
		Leeds New Comp—			
4500/7		Old stock	£100	10 0 0	175 to 177
3500/7		New do.	£100	6 0 0	113 to 114
8000	6¼	Do., shares	6 5 0	6 0 0	7 to 7¼
3900	10	*Leicester*	10 0 0	8 0 0	16¼ to 16¾
		Leigh			
426¾	21	Leighton Buzzard	21 0 0	7 0 0	25 0 0
400	10	Leominster	10 0 0	5 0 0	9 0 0
330	25	Lewes, A shares	25 0 0	8 0 0	31 5 0
644	5	Do., B shares	5 0 0	8 0 0	6 5 0
245	5	Leyburn, Yorksh.	5 0 0		6 0 0
		Leyland, Lancash.			
250	20	Lichfield	20 0 0	10 0 0	40 0 0
320	25	*Lincoln*	25 0 0	10 0 0 & Bns. of 12/6	70 0 0
300	5	Lindfield (Limited)	5 0 0		5 0 0
240	5	Liskeard	5 0 0	8 0 0	6 0 0
240	5	Littlehampton	5 0 0	7 10 0	5 0 0
	100	*Liverpool United*	£100	10 0 0	205 0 0
	25	Do., ¼ share	25 0 0	10 0 0	50 0 0
259	5	Llandovery (Lim.)	1 10 0		
		Llandudno Gas & Water			
		Llanelly £3000		5 0 0	
		Llanfyllin (Lim.) £2000.			
		Llangollen			
250	10	Llanrwst (Limited)	9 15 0	5 0 0	9 15 0
		LONDON COMPANIES.			
5000	10	Anglo-Romano (*en commandite*)	10 0 0	8 0 0	10 to 12
		Bahia (L.) £100,000			
5000	20	British Provincial	20 0 0	8 0 0	26½ to 27½
	20	Do., new	16 0 0	8 0 0	18 to 19
		(Norwich, Hull-Sculcoates, Shelton Potteries, Trowbridge, & Holywell.)			
12000	50	*Chartered*	50 0 0	6 10 0	73 to 75
6000	50	Do.	20 0 0	6 10 0	35 to 37
10000	20	*City of London*, A shares	20 0 0	7 0 0	27½ to 28½
10000	10	Do., B shares	10 0 0	4 0 0	7½ to 7¾
10000	10	Do., new shares	8 0 0	7 0 0	10½ to 11
10000	25	*Commercial*	25 0 0	10 0 0	38 to 40
6000	25	Do., new shares	7 10 0	10 0 0	11 to 12
1891	5	County & General (Limited)	5 0 0	6 0 0	
2000	5	Do., preference	5 0 0	6 0 0	
		(Pater, Pembroke, Chertsey, Lea Bridge, Northfleet, Walton, & Ware.)			
5000	10	*Crystal Palace District*	10 0 0	7 0 0 & Bns.	14 to 14¼
5000					
4000	10	Do., preference	1 0 0	6 0 0	1 10 0
4000	50	*Equitable*	50 0 0	10 0 0	81 to 83
23406	25	Do., new shares	10 0 0	10 0 0	18 to 20
	10	European (Lim.) (Boulogne, Amiens, Rouen, Caen, Havre, & Nantes.)	10 0 0	10 0 0	13⅞ to 14¼
17216	10	*Great Central Gas Consumers*	10 0 0	6 0 0	12⅞ to 13¼
13000	50	*Imperial*, old sh.	50 0 0	10 0 0	81 to 83
13000	50	Do., new shares	40 0 0	10 0 0	65 to 66
1300	100	Do., bonds	£100	10 0 0	200 to 205
28000	50	*Imperial Continental* (Amsterdam, Berlin, Ghent, Hanover, Lille, Rotterdam, Aix-la-Chapelle, Antwp., Bordeaux, Brussels, Cologne, Frankfort-on-M., Haarlem, Toulouse, & Vienna.)	43 5 0	8 1 10	49 to 51
3000	40	*Independent*	40 0 0	5 0 0 & Bns.	60 to 63
4904	50	*London*	50 0 0	7 0 0	71 to 73
5519	25	Do., 1st pref.	25 0 0	6 0 0	29½ to 30½
1921	50	Do., 2nd pref.	50 0 0	6 0 0	66 to 68
870	50	Do., 3rd pref.	50 0 0	6 0 0	66 to 68
20455/		Do., 1st pref. sk		6 0 0	
13608/		Do., 2nd pref. sk		6 0 0	
		London & Provncl. Gas & Water (Lim.) £50,000			
50000	1	Oriental (Limited), Calcutta	1 0 0	4 10 0	1⅛ to 1⅜
50000	1	Do., new shares	0 15 0	4 10 0	⅝ to 1
9000	60	*Phœnix*	55 0 0	10 0 0	71 to 73
5000	20	*Ratcliff*	18 0 0	6 17 6	19 to 20
4000	50	*Sth. Metropolitan*	42 0 0	10 0 0	61 to 62
12633	10	*Surrey Consumers*	10 0 0	8 0 0	14¾ to 15¼
2147	10	Do., new shares	2 0 0	8 0 0	2 5 0
9000	50	United General (Dublin & Limerick)	50 0 0	2 6 0	26 to 27
10000	10	*Victoria Docks*			
1500	10	*Wandsworth & Putney*	10 0 0		
1500	10	Do., new shares			
20000	10	Western (Limited) A shares	10 0 0	9 0 0	16 to 16½
10000	10	Do., B shares	3 0 0	9 0 0	5 to 6
2777	5	*West Ham*	5 0 0		
13223	5	Do., new shares			
		Wt. London Junc. (Lim.) £13,500			
		Long Buckby (L.)			
120	10	Long Sutton (Lim.)	10 0 0	7 10 0	11 to 12
		Longton (Lim.)			
		Longwood, near Huddersfield			
250	5	Lostwithiel	5 0 0		6 0 0
250	1	Do., new shares	1 0 0		1 0 0
711	6	Loughborough	6 0 0	8 0 0	9 0 0
711	6	Do., new shares	4 0 0	8 0 0	6 0 0
240	25	*Louth*	25 0 0	10 0 0	
2500	10	*Lowestoft G. & W.*			
611	5	Ludlow Union	5 0 0	5 0 0	5 5 0
250	5	Do., pref. shares	5 0 0	5 0 0	
640	10	*Luton*	10 0 0	7 10 0 & Bns.	12 0 0
640	5	Do., preferential	5 0 0	4 0 0	5 0 0
640	5	Do., new shares	5 0 0	7 10 0 & Bns.	6 0 0
100	20	Lutterworth	20 0 0	6 5 0	25 0 0
		Lydney (L.) £3000			
63	20	Lyme Regis	20 0 0	4 0 0	20 0 0
120	25	Lymington	25 0 0	5 0 0	25 0 0
		Lymm			
300	10	Maidenhead	10 0 0	5 0 0	10 0 0
500	25	*Maidstone*, A sh.	25 0 0	10 0 0	45 0 0
500	25	Do., B shares	25 0 0	4 0 0	20 0 0
	25	Do., new shares	25 0 0	7 10 0	
204	23	Maldon	23 0 0	7 0 0	27 0 0
200	10	Malmesbury	10 0 0	2 10 0	5 15 0
		Malvern Link (Lim.) £5000,			
		Manningtree			
		Mansfield £3000		10 0 0	
150	10	Mansfield Woodhouse	10 0 0		
		March			
		Margate (*see* Isle of Thanet)			
		Market Drayton			
132	25	Market Harboro'	25 0 0	7 0 0	35 0 0
		Market Weighton			
		Markyate St. (L.)			
		Marlborough			
150	10	Marsden (Lim.)	10 0 0	5 0 0	10 0 0
370	10	Maryport	10 0 0	6 0 0	12 0 0
500	5	Matlock Baths	5 0 0		
200	2	Measham (Lim.)	1 12 6	5 0 0	
220	10	Melbourne	10 0 0	6 0 0	12 0 0
		Melksham			
934	2	Meltham	2 0 0	4 10 0	
		Melton Mowbray			
50	10	Mere	10 0 0		
		Merthyr Tydvil			
120	10	Middleham	10 0 0	5 0 0	10 0 0
3000	10	*Middleton*		10 0 0	
		Middleton-in-Teesdale (L.) £1000.			
400	5	Midhurst (Lim.)	5 0 0	2 10 0	5 0 0
		Midsmmr. Norton			
198	5	Mildenhall	5 0 0	5 0 0	
		Milnthorpe (Lim.) £1500.			
		Milverton (Lim.)			
2000	5	*Mirfield*	5 0 0	5 0 0	6 5 0
700	10	Mitcham	10 0 0	10 0 0	14 10 0
650	5	Mold Gas & Water	5 0 0	7 10 0	6¾ to 6½
700	10	Monmouth Gas & Water	10 0 0	5 0 0	10 0 0
250	5	Montgomery (L.)	5 0 0		
150	10	Moreton-in-Marsh	9 2 6	4 0 0	9 2 6
1000	5	Morley, nr. Leeds	5 0 0	6 0 0	6 15 0
220	16	Morpeth	16 0 0	5 0 0	17 10 0
		Mossley			
		Mottram			
		Nayland			
		Neath			
185	10	Needham Market	10 0 0	4 0 0	
		Nelson (L.) £5000.			
		Netherthong (Lim.) £700			
		Newark £5000		10 0 0	
		Newburn			
250	20	Newbury	20 0 0	5 0 0	20 0 0
16000	8	Newcastle & Gateshead Union	8 0 0	7 0 0	13 to 13¼
		Newcastle-under-Lyne			
250	5	Newent	5 0 0		
		Newhaven, Sussex			
		New Malton			
600	5	Newmarket	5 0 0	4 0 0	4 0 0
366	2	Do., preference	2 0 0	6 0 0	2 0 0
		New Mill (L.) £7000			
200	20	*New Mills & Hayfield*	15 10 0	5 0 0	
70	20	Newnham (Lim.)	20 0 0		21 0 0
		Newport Pagnell			
360	35	*Newport, Monmouth*, A sh.	35 0 0	9 0 0	50 0 0
540	35	Do., B shares	35 0 0	7 10 0	42 10 0
		Newport, Salop			
250	5	New Romney (Ld.)	5 0 0	5 0 0	5 0 0
		Newton Abbott			

No. of Shares issued.	Amount per Share.	Name of Company.	Amount paid up per Share.	Div. per Cent. per Annum.	Price per Share.
	£		£ s d	£ s d	£ s d
198	10	Newtown, Montgomeryshire	10 0 0	6 0 0	10 0 0
		Northallerton			
777	20	*Northampton*, A shares	20 0 0	10 0 0	
777	20	Do., B shares	20 0 0	4 0 0	
777	20	Do., C shares	10 0 0	7 10 0	
		North Bierley (Lim.) £20,000			
		Northfleet (*see* Co. & General)			
2914	5	N. Shields, Tynemouth	5 0 0	5 0 0	6 to 6¼
120	10½	North Walsham	10 10 0	5 0 0	10 15 0
371	15	Northwich	15 0 0	5 0 0	15 0 0
		Norwich (*see* Brit. Provincial)			
4000	50	*Nottingham*	50 0 0	5 0 0	
	50	Do., new shares	50 0 0	10 0 0	
268	8	Nuneaton (Lim.)	8 0 0	5 0 0	7 10 0
125	8	Do., new shares	8 0 0	5 0 0	7 10 0
		Oaken Gates, Salop			
240	5	Oakhampton (Lim.)	5 0 0		
200	10	Odiham	10 0 0	5 0 0	10 0 0
		Olney			
360	10	*Ormskirk*, old sh.	10 0 0	8 0 0	14 0 0
1080	10	Do., new shares	4 10 0	8 0 0	6 4 6
2400	5	*Ossett & Horbury*	5 0 0	5 0 0	5 10 0
		Oswestry			
		Otley, Yorkshire			
80	25	Oundle	25 0 0	7 0 0	25 0 0
600	15	*Over Darwen*, original	15 0 0	7 10 0	22 10 0
600	15	Do., A shares	15 0 0	7 10 0	22 10 0
1200	15	Do., B shares	5 0 0	6 0 0	12 15 0
1694	1	Over & Wharton (Limited)	1 0 0		1 2 0
120	150	*Oxford*	£150	9 10 0	250 0 0
1527	5	Padiham	5 0 0	6 0 0	6 0 0
		Paington (Lim.)			
338	2½	Painswick	2 10 0		2 10 0
		Pangbourne (Lim.) £1500			
		Pately Bridge, Yorkshire			
300	5	Peel, Isle of Man	5 0 0	7 0 0	6 to 7
		Pembroke (*see* Co. & General)			
500	20	*Peniston, Thurlstone, & Oxspring*			
250	20	Penrith	15 0 0	6 10 0	21 0 0
153	20	Penzance	20 0 0		15 0 0
320	5	Petersfield	5 0 0	5 0 0	
200	10	Petworth	10 0 0	9 17 6	15 0 0
		Pickering			
2500	10	*Plymouth & Stonehouse*	10 0 0	10 0 0	20 0 0
2500	10	Do., new shares	10 0 0	7 10 0	15 0 0
160	10	Pocklington	10 0 0		5 0 0
		Ponder's End & Enfield Highway (L)			
		Pontefract			
		Pontypridd		4 0 0	
400	10	Poole	10 0 0	10 0 0	15 0 0
344	2	Do., new shares	2 0 0	10 0 0	3 0 0
		Port Madoc			
600	53	*Portsea Island*	53 0 0	6 0 0	66 to 69
600	50	Do., new shares	50 0 0	6 0 0	62 to 65
120	10	Potton, Bedfordsh.	10 0 0	5 0 0	10 0 0
400	10	Prescott	10 0 0	5 0 0	
		Presteign			
60000	8k.	*Preston*	All.	10 0 0	200 0 0
3000	20	Do., new shares	11 0 0	10 0 0	23 0 0
1000	10	Provincial (Hull)	8 0 0		8 0 0
600	20	*Pudsey*	20 0 0	7 10 0	30 0 0
600	6¾	Do., new shares	4 13 4	7 10 0	4 13 4
93	20	Pwllheli	20 0 0	2 10 0	25 0 0
600	5	Quorndon & Mountsorrel	5 0	7 0 0	12 0 0
900	10	*Radcliff & Pilkington*, No. 1	10 0 0		
2100	10	Do., No. 2	6 0 0		
200	20	Ramsay, I. of Man	20 0 0	6 10 0	23 0 0
		Ramsey, Hunts			
		Ramsgate (*see* Isle of Thanet)			
		Rawmarsh			
1019	10	*Reading*	10 0 0	6 0 0	10 10 0
500	20	*Reading Union*	20 0 0	7 10 0	23 0 0
		Redbourn (Lim.) £1100			
400	5	Redcar	5 0 0	4 0 0	5 0 0
		Redhill (L.) £4000			
		Redruth			
		Reigate			
1200	1	Repton (Limited)	1 0 0	5 0 0	1 1 0
2000	10	Richmond, Surrey (Limited)	10 0 0	7 0 0	15 0 0
400	5	Rickmansworth	5 0 0		5 0 0
180	10	Ringwood	10 0 0	5 0 0	10 0 0
180	33¼	Ripon	33 10 0	4 10 0	
		Rochester & Chatham £20,000		6 0 0	
		Rochford			
		Romford			
200	25	Romsey			
	25	*Rotherham*, A sh.	25 0 0	8 0 0	36 0 0
200	12½	Do., B shares	12 10 0	8 0 0	18 0 0
600	12½	Do., C shares	8 0 0	8 0 0	11 0 0
600	20¾	Do., D shares	2 10 0	8 0 0	3 10 0
		Rothwell			
350	10	Royston	10 0 0	5 0 0	9 10 0
150	20	Rugby	20 0 0	10 0 0	
150	5	Do., ¼ shares	5 0 0	10 0 0	
150	6¾	Do., ¼ shares	6 13 4	10 0 0	
150	10	Do., new shares	10 0 0	10 0 0	
150	2½	Do., do.	2 10 0	10 0 0	
150	3¾	Do., do.	3 6 8	10 0 0	
430	10	Rugely	10 0 0	5 0 0	10 10 0
		Runcorn £11,000		7 10 0	
114	31½	Ruthin	31 5 0	6 16 0	40 0 0
500	10	Ryde	10 0 0	6 0 0	12 0 0
500	5	Rye	5 0 0	6 0 0	6 0 0
		Saddleworth			
225	22	Saffron Walden	22 0 0	4 0	16 to 18
1400	5	St. Alban's Gas & Water (Limited)	5 0 0	5 0 0	5 5 0
320	5	St. Asaph (Lim.)	5 0 0		
		St. Austell			
		St. Colomb			
3000	10	*St. Helen's*	10 0 0	10 0 0	19 0 0
		St. Ives, Cornwall			
180	10	St. Neot's	10 0 0	8 0 0	12 0 0
400	25	Salisbury	25 0 0	6 0 0	28 0 0
341	10	Sandbach	10 0 0	5 0 0	12 10 0
381	10	Sandwich	10 0 0	5 0 0	9 10 0
		Sandy, Beds			
		Sawbridgeworth			
100	10	Saxmundham	10 0 0	5 0 0	
2000	10	*Scarborough*	10 0 0	7 0 0	13 0 0
1000	10	Do.	6 0 0	7 0 0	12 2 6
240	5	Sedburgh	5 0 0		
300	16	Selby	16 0 0	5 0 0	
140	5	Settle (Limited)	3 10 0	5 0 0	
290	10	Sevenoaks	10 0 0	4 0 0	10 0 0
300	10	Shaftesbury (Lim.)	10 0 0	5 0 0	8¼ to 9
565	5	Sheepshed (Lim.)	5 0 0	6 0 0	6 0 0
1298	5	Sheerness Consumers	5 0 0	7 0 0	
135000	Sk.	*Sheffield United*, A shares	All.	10 0 0	192 0 0
392647	Sk.	Do., B shares	All.	8 0 0	162 0 0
4800	16g.	Do., D shares	9 0 0	8 0 0	8 7 6
1600	6gs.	Do., E shares	3 7 6	8 0 0	3 2 6
600	5	Shefford (Limited)	4 0 0		
		Shelton, Potteries (*see* Brit. Prov.)			
350	10	Shepton Mallet	10 0 0	7 10 0	10 0 0
800	5	Sherborne	5 0 0	7 10 0	5 0 0
		Shiffnal, Salop			
1000	5	*Shipley*	5 0 0	6 0 0	7 10 0
150	10	Shipston-on-Stour	10 0 0	4 0 0	
		Shirley & Freemantle, Hants			
240	25	Shotley Bridge (Limited)	25 0 0	7 0 0	30 0 0
240	10	Do., new shares	10 0 0	7 0 0	12 0 0
1000	10	*Shrewsbury*, A sh.	10 0 0		
1000	10	Do., B shares	10 0 0		
530	10	Do., new shares	10 0 0		
		Sible Hedingham			
400	15	Skipton	15 0 0	5 0 0	18 0 0
400	2½	Do., new shares	2 16 0	5 0 0	3 0 0
250	20	Sleaford	20 0 0	5 0 0	20 0 0
250	10	Slough	10 0 0		
340	5	Snaith	5 0 0		4 0 0
		Soham			
150	10	Somerton	10 0 0		
354	5	Southam	5 0 0		
1000	50	*Southampton*	50 0 0	8 0 0	
		Southborough			
		Southend, Essex			
220	10	South Molton	10 0 0	5 10 0	7 10 0
2000	10	*South Shields*	10 0 0	7 0 0	10 11 6
248	10	Southwell (Lim.)	10 0 0	5 0 0	11 to 11¼
300	5	Southwold	5 0 0	5 0 0	5 0 0
1470	1	Spennymoor (Lim.)	1 0 0		
400	5	Spilsby	5 0 0		
		Spittal, Berwick-on-Tweed			
2000	6¾	*Stafford*	6 13 4	6 10 0	9 0 0
2000	6¾	Do., new shares	4 0 0	6 10 0	5 0 0
178	5	Staindrop	5 0 0	6 0 0	5 0 0
248	25	Staines & Egham	25 0 0	6 0 0	26 to 27
		Staley Bridge, £15,000		10 0 0	
225	50	*Stamford & St. Martin's*	50 0 0	8 0 0	45 to 50
150	10	Staveley (Limited)	10 0 0	5 0 0	11 10 0
300	5	Stevenage	5 0 0	5 0 0	5 0 0
2000	10	*Stoke Fenton & Longton*	10 0 0	7 0 0	12 0 0
500	10	Do., new shares	2 0 0	7 0 0	
400	5	Stone, Stafford	5 0 0	5 0 0	6 0 0
220	10	Stoney Stratford	10 0 0	4 10 0	9 0 0
		Storrington (Lim.) £1000			
		Stourbridge, £5000			
		Stow-on-the-Wold			
150	20	*Stratford-on-Avon*	20 0 0	8 0 0	34 0 0
150	5	Do., new shares	5 0 0	8 0 0	8 10 0
750	5	Stretford	5 0 0	6 0 0	5 5 0
		Stroud			
261	20	Sudbury	20 0 0	5 0 0	20 0 0
18120	5	*Sunderland*	5 0 0	8 0 0	8 0 0
3000	5	Do., new shares	5 0 0	8 0 0	7¾ to 8
200	10	Sutton Coldfield (L)	10 0 0		10 0 0
350	10	Sutton-in-Ashfield	10 0 0	7 10 0	12 10 0
		Sutton Southcoates & Drypool, Hull	20 0 0		23 to 24
		Sutton, Surrey			
169	10	Swaffham	10 0 0	5 0 0	7 0 0
240	25	*Swansea*	25 0 0		25 to 26
600	25	Do., new shares	25 0 0		25 to 26
		Swindon			
200	10	Swineshead (Lim.)	10 0 0	5 0 0	10 5 0
180	10	Syston	10 0 0		10 0 0
276	5	Tadcaster	5 0 0	5 0 0	3 0 0
		Tamworth			
		Tattershall & Coningsby (Lim.)			
2800	5	*Taunton*	5 0 0	6 0 0	6 0 0
2800	1½	Do., new shares	1 10 0	6 0 0	
		Tavistock			
200	5	Tenbury Union	5 0 0	5 0 0	5⅛ to 6
150	10	Tenterden	10 0 0	4 0 0	8 0 0
200	10	Tetbury, Gloster	9 0 0	5 0 0	
		Tewkesbury			
200	10	Thame	10 0 0	5 0 0	10 0 0
250	10	Thetford	10 0 0	6 0 0	10 to 11
150	10	Thornbury (Lim.)	10 0 0	4 0 0	
80	1	Do., new shares	1 0 0	4 0 0	
356	5	Thorne	5 0 0		4 0 0
160	10	Thrapston (Lim.)	10 0 0	5 0 0	10 0 0
		Tideswell (L.) £2000			
1885	5	Todmorden (Lim.)	5 0 0	7 10 0	7 10 0
600	2½	Topsham (Lim.)	2 10 0	5 0 0	
		Torpoint (Lim.)			
		Torquay			
		Torrington, Devon			
		Totnes			
		Totnes Consumers			
5000	5	*Tottenham & Edmonton*	5 0 0	8 0 0	6 0 0
150	10	Towcester	10 0 0	5 0 0	10 0 0
		Town-Malling			
275	10	Tring	10 0 0	5 0 0	10 0 0
		Trowbridge (*see* Brit. Prov.)			
320	25	Truro	25 0 0	8 0 0	
		Tunbridge			
		Tunbridge Wells			
100	10	Tuxford	10 0 0	5 0 0	12 0 0
600	5	Tyldesley (Lim.)	5 0 0	7 10 0	7 0 0
		Ulverston			
		Uppingham			
240	5	Upton-on-Severn	5 0 0	5 0 0	5 0 0
310	5	Usk (Limited)	5 0 0	7 0 0	6 12 6
250	10	Uttoxeter	10 0 0	5 0 0	11 to 12½
		Uxbridge			
		Ventnor			
160	10	Wainfleet (Lim.)	10 0 0		8 0 0
1000	25	*Wakefield*	25 0 0	10 0 0	44 0 0
3660	5	Do.,	5 0 0	10 0 0	8 16 0
1732	5	Do., new shares	5 0 0	7 10 0	6 15 0
		Walker & St. Anthony (L.) £2000			
300	10	Wallingford	10 0 0	5 0 0	8 0 0
		Walton-on-Tham (*see* Co. & Gen.)			
200	10	Wantage	9 0 0	5 0 0	10 10 0
		Ware (*see* County & General)			
100	10	Wareham	10 0 0	3 10 0	8 0 0
2000	1	Warkworth and Amble	1 0 0	3 10 0	
200	25	Warminster	25 0 0	6 0 0	28 0 0
900	20	*Warrington*	20 0 0	10 0 0	39 0 0
900	20	Do., new shares	13 0 0	10 0 0	24 0 0
		Warth			
		Warwick. £15,000		6 0 0	
		Watford			
400	11¼	Weedon (Limited)	11 10 0	7 10 0	17 5 0
400	3	Do., new shares	1 10 0	8 10 0	2 5 0
111	25	Welchpool, Montg.	25 0 0	5 0 0	25 0 0
		Wellingborough			
450	10	Wellington, Salop	10 0 0	7 10 0	12 10 0
		Wellington, Som.			
160	25	*Wells*, Somerset	25 0 0	10 0 0	
		Wem (Lim.) £2000			
160	10	Westbury	10 0 0		
		West Cowes			
225	10	Westerham (Lim.)	10 0 0	5 0 0	11 0 0
454	5	W. Malling G. & W.	5 0 0	3 0 0	4 10 0
400	20	*Weston-sup-Mare*	20 0 0	6 10 0	
200	5	Wetherby	5 0 0		1 10 0
2000	10	*Weymouth*			
		Whaley Bridge (Lim.) £2000			
2300	1	Whitchurch, Hants	0 10 0	2 10 0	
400	25	Whitehaven	25 0 0	2 0 0	14½ to 15
		Whitehaven New			
		Whitstable			
250	10	Whittlesea	10 0 0	5 0 0	11 0 0
300	10	Whitwick & Coalvle	10 0 0		10 0 0
1200	5	*Whitworth Vale*	5 0 0	6 0 0	6 14 0
1200	5	Do., new shares	3 15 0	6 0 0	4 17 0
		Widnes Gs. & Wtr.			
1250	10	*Wigan*	10 0 0	10 0 0	20 0 0
1250	10	Do., preference	10 0 0	5 0 0	10 0 0
2500	10	Do., new shares	5 0 0	7 10 0	8 0 0
400	5	Wigston	5 0 0	6 0 0	5 0 0
		Wigton, Cumberd.			
1020	5	*Willenhall*, A sh.	5 0 0		
1020	54s.	Do., B shares	2 14 0	5 0 0	
		Do., new shares			
		Wilton			
600	10	Wimbledon	8 0 0		8 0 0
240	10	Wimborne Minster	10 0 0		
130	10	Wincanton	10 0 0	7 0 0	
		Winchcombe £1500			
380	50	Winchester	50 0 0	5 0 0	50 0 0
1100	20	Windsor (Limited)	20 0 0	6 5 0	23 0 0
141	10	Winslow	10 0 0	6 0 0	10 0 0
120	10	Winterton (Lim.)	10 0 0	5 0 0	
120	5	Do., new shares	5 0 0	5 0 0	
200	10	Wirksworth	10 0 0	5 0 0	10 0 0
		Wisbeach			
		Witham			
		Witney			
400	5	Wivelscombe (L.)	5 0 0	6 0 0	5 5 0
		Wivenhoe (L) £2000			
200	10	Woburn	10 0 0	5 0 0	11 0 0
210	10	Wokingham	10 0 0	5 0 0	
4448	10	*Wolverhampton*	10 0 0	10 0 0	20 0 0
4448	10	Do., new shares	6 0 0	10 0 0	13 10 0
550	10	Woodbridge (Lim.)	10 0 0	5 0 0	
660	2½	Woodstock	2 10 0	5 0 0	
		Woodhouses			
200	7	Wooler	7 0 0		
		Woolwich Consrs.			
		Woolwch. Equitable			
2400	10	*Worcester*	10 0 0	7 0 0	14 7 6
600	10	*Worksop*	10 0 0	5 0 0	
600	5	Do., new shares	5 0 0	5 0 0	
		Worthing			
		Worsboroughdale & Worsboro' (Lim.) £2500			
270	12	Wotton-un.-Edge	12 0 0	4 0 0	7 0 0
600	5	Wrexham, A sh.	5 0 0	7 10 0	5 0 0
600	5	Do., B shares	5 0 0	5 0 0	5 0 0
600	5	Do., C shares	3 10 0	5 0 0	3 10 0

No of Shares issued	Amount per Share.	Name of Company.	Amount paid up per Share.	Div. per Cent. per Annum.	Price per Share.
	£		£ s d	£ s d	£ s d
		Wye, Kent			
		Wylam			
400	5	Wymondham	5 0 0	6 10 0	5 0 0
		Yarmouth, I. of W.			
795	20	Yarmouth, Norfk.	20 0 0	5 0 0	18 to 20
1675	4	Yeadon & Guiseley, near Leeds	4 0 0	7 10 0	4 10 0
1675	2	Do., new shares	0 5 0		
140	30	Yeovil	30 0 0	6 0 0	30 0 0
140	10	Do., new shares	10 0 0	6 0 0	10 0 0
12000	5	*York United*	5 0 0	10 0 0	10 2 6
3000	5	Do., new shares	2 0 0	10 0 0	5 5 0
		SCOTLAND.			
26000	2½	Aberdeen	2 10 0	10 0 0	5 1 0
		Abernethy			
		Aberlour (L.) £650			
500	10	Airdrie	10 0 0	9 0 0	14 10 0
		Alloa			
		Alva, nr. Stirling			
		Alyth			
600	5	Annan	5 0 0	5 0 0	5 0 0
1600	1	Anstruther & Cellardyke	1 0 0	8 0 0	1 6 0
825	20	Arbroath	20 0 0	7 10 0	30 0 0
100	20	Ardrossan	20 0 0	5 0 0	20 0 0
658	1	Auchinleck	1 0 0		
381	5	Auchterarder	5 0 0	7 10 0	7 10 0
750	2	Auchtermuchty	2 0 0	6 0 0	2 10 0
2932	5	Ayr	5 0 0	5 0 0	5 12 0
4250	2	Ayr & Newton Cons.	2 0 0	6 0 0	2 0 0
300	10	Banff	10 0 0	6 0 0	11 0 0
2158	1	Barrhead	1 0 0	7 10 0	1 0 0
200	5	Bathgate	5 0 0	5 0 0	5 0 0
		Beith			
976	1	Bervie	1 0 0	5 0 0	
		Biggar			
739	5	Blairgowrie	5 0 0	8 0 0	7 0 0
		Borrowstowness			
540	5	Brechin	5 0 0	10 0 0	11 5 0
		Bridge of Allan			
2272	2	Broughty Ferry	2 0 0	7 10 0	2 7 6
		Campbelton			
250	4	Carluke, Lanark	4 0 0	7 10 0	4 0 0
178	5	Castle Douglas	5 0 0	5 0 0	5 0 0
1666	3	Coatbridge	3 0 0	10 0 0	4 5 0
200	5	Coldstream	5 0 0	6 0 0	5 0 0
		Collinsburgh			
1000	1	Comrie	1 14 8	4 10 0	1 14 8
1200	1	Crail, Fife	1 0 0	5 0 0	1 0 0
2744	1	Crieff	1 0 0	10 0 0	1 15 0
600	1	Cullen	1 0 0	5 0 0	0 15 0
280	2½	Cumbernauld	2 10 0	5 0 0	2 10 0
200	5	Cumnock	5 0 0	6 0 0	6 0 0
600	5	Cupar Angus	5 0 0	7 0 0	6 10 0
250	10	Cupar Fife	10 0 0	10 0 0	18 10 0
300	10	Dalkeith	10 0 0	10 0 0	20 0 0
		Deanston			
750	2	Denny	2 0 0	6 5 0	2 5 0
		Denny Consumers			
	5	Dornoch			
500	1	Douglas	1 0 0	6 0 0	1 2 0
		Dufftown			
		Dumbarton			
400	20	Dumfries	14 0 0	7 2 10	14 10 0
391	5	Dunbar	5 0 0	6 0 0	5 10 0
		Dunblane			
1250	23⅓	*Dundee*	23 15 0	8 15 9	54 0 0
8000	5	*Dundee, New*	5 0 0	5 0 0	5 15 0
860	10	Dunfermline	10 0 0	7 10 0	16 10 0
		Dunkeld			
1750	2	Dunoon	2 0 0	6 0 0	2 3 0
		Dunse			
250	5	Dysart	5 0 0	7 10 0	6 10 0
2327	1	East Wemyss	1 0 0	6 0 0	1 2 0
750	1	Ecclefechan	1 0 0		
6000	25	*Edinburgh*	25 0 0	10 0 0	52 0 0
6400	25	*Edinburgh & Leith*	25 0 0	10 0 0	53 0 0
621	12	Elgin	12 0 0	6 0 0	13 0 0
1300	1	Elie & Earlsferry	1 0 0	7 5 0	1 3 0
		Ellon			
		Errol			
		Eyemouth			
	14	Falkirk	14 0 0	7 0 0	14 0 0
		Falkirk, New			
632	2	Falkland	2 0 0	5 0 0	2 0 0
2000	1	Ferry Porton Craig	1 0 0	6 5 0	1 3 0
581	1	Fochabers	1 0 0	5 0 0	1 2 0
1440	5	Forfar	5 0 0	7 10 0	7 12 6
360	5	Do., new shares	2 10 0	7 10 0	6 10 0
		Fort William			
2000	1	Fraserburgh	0 16 0	5 0 0	0 18 0
500	5	Galashiels	5 0 0	10 0 0	9 10 0
		Gatehouse, n. Fleet			
900	2½	Girvan	2 10 0	6 0 0	2 10 0
5200	25	*Glasgow*	25 0 0	10 0 0	44 10 0
3200	6½	Do., new shares	6 5 0	10 0 0	12 1 3
15000	10	*Glasg. City & Sub.*	10 0 0	10 0 0	16 10 0
		Grahamston			
190	10	Grangemouth	10 0 0	5 0 0	10 0 0
400	8½	Haddington	8 5 0	7 10 0	11 10 0
		Hamilton			
	5	*Hamilton, New*	5 0 0	4 10 0	6 0 0
440	5	Hawick	5 0 0	7 10 0	7 10 0
300	5	Helensburgh	5 0 0	7 10 0	7 10 0
1312	1	Huntly	0 0	7 10 0	1 5 0
250	5	Inverary	5 0 0	10 0 0	6 12 6
425	1	Inverkeithing	1 0 0	5 0 0	1 0 0
1200	10	*Inverness G. & Wr.*	10 0 0	7 0 0	14 0 0
2400	5	Do., new shares	1 5 0	7 0 0	2 0 0
		Inverury			
	10	Irvine	10 0 0	10 0 0	14 0 0
	2½	Do.	2 10 0	10 0 0	3 12 6
300	5	Jedburgh	5 0 0	7 10 0	7 10 0
		Johnstone, Paisley			
1300	1	Keith	1 0 0	5 0 0	0 11 0
600	5	Kelso	5 0 0	10 0 0	11 0 0
620	2	Kelsyth	2 0 0	5 0 0	2 0 0
950	1	Kennoway	1 0 0	5 0 0	1 1 0
1515	1	Kettle Frenchie & Kettle Bridge	1 0 0	5 0 0	5 0 0
600	25	Kilmarnock	25 0 0	7 10 0	30 0 0
600	25	Do., new shares	7 10 0	7 10 0	
334	5	Kincardine	5 0 0	5 0 0	4 10 0
		Kinghorn			
		Kingskettle, Fife			
		Kinross			
1200	5	Kirkcaldy	5 0 0	10 0 0	10 10 0
320	5	Kircudbright	5 0 0	5 0 0	5 0 0
997	3	Kirkintulloch	3 0 0	6 13 4	3 7 0
		Kirkwall			
		Kirriemuir			
		Lanark			
3500	1	Lanark Conrs. (L)	1 0 0		1 2 6
		Largo, near Leven			
280	8	Largs	8 0 0	7 10 0	8 10 0
1309	1	Lasswade	1 0 0		
177	5	Lauder	5 0 0	5 0 0	5 0 0
2000	1	Leslie, Fife	1 0 0	7 10 0	1 5 0
618	1	Lesmahago	1 0 0	6 0 0	1 0 0
		Leuchars			
1800	1	Leven	1 0 0	7 10 0	23*s.* to 25*s.*
100	10	Linlithgow	10 0 0	10 0 0	19 0 0
		Linton			
		Lochee, n. Dundee			
434	5	Lochgilphead (Ld.)	5 0 0	7 0 0	5 10 0
380	5	Lochwinnock	5 0 0	3 10 0	4 0 0
		Macduff			
1200	1	Markinch, Paisley	1 0 0	8 0 0	1 5 0
		Maryhill, n. Glasg.			
282	3	Mauchline	3 0 0	5 0 0	3 0 0
		Maxwell Town			
423	5	Maybole, Ayrshire	5 0 0	4 10 0	5 0 0
		Meigle (L.) £700			
373	2	Melrose	2 0 0	7 10 0	2 10 0
718	2	Mid & East Calder	2 0 0		2 0 0
200	5	Moffat	5 0 0	5 0 0	
120	2½	Do., new shares	2 10 0	5 0 0	
400	20	Montrose	20 0 0	10 0 0	35 0 0
		Muirkirk (L.) £1000			
800	5	Musselburgh	5 0 0	8 0 0	7 10 0
618	1	Nairn	1 0 0	5 0 0	1 0 0
		Neilston, n. Glasg.			
300	5	Newburgh, Fife	5 0 0	8 0 0	7 0 0
300	1	Do., new shares	1 0 0	8 0 0	
1200	1	Newmilns	1 0 0	7 10 0	1 2 0
1300	1	Newport, Fife	1 0 0	5 0 0	1 0 0
		Newton-on-Ayre			
107	14½	Newton Stewart	14 10 0	5 0 0	14 10 0
300	5	N. Berwick, N.B.	5 0 0	5 0 0	7 10 0
		N. Queensferry			
245	5	Oban	5 0 0	7 10 0	5 7 6
1000	5	Peebles	5 0 0	6 0 0	5 0 0
500	2½	Do., new shares	2 10 0	6 0 0	2 10 0
1000	25	Perth	25 0 0	8 0 0	32 0 0
3000	5	Perth, New	5 0 0	6 0 0	5 12 6
		Peterhead			
2000	1	Pettenween	1 0 0	6 0 0	1 1 0
2416	1	Pollokshaws	1 0 0	7 10 0	1 5 0
		Port Glasgow			
		Portobello			
		Portsoy			
200	5	Prestonpans	5 0 0	6 0 0	
		Renton, Dumbrtn.			
		Rothes			
1500	1¼	Rutherglen	1 6 8	5 0 0	1 6 8
250	12	St. Andrew's	12 0 0	8 6 8	16 10 0
193	12	Do., new shares	12 0 0	8 6 8	16 10 0
400	5	Saltcoats	5 0 0	7 10 0	6 0 0
936	1	Sanquhar	1 0 0	5 0 0	0 15 0
30	1	Do., preference	1 0 0	5 0 0	
400	5	Selkirk	5 0 0	7 10 0	7 10 0
200	5	South Queensferry	5 0 0	10 0 0	6 to 6½
7450	2	Stirling	2 0 0	8 0 0	3 10 6
2500	1	Stonehaven	1 0 0	6 5 0	1 5 0
1110	1	Stonehouse	1 0 0	7 10 0	13*s.* to 15*s.*
600	2½	Stornoway	2 10 0	8 0 0	3 10 0
500	5	Stranraer	5 0 0	7 10 0	6 0 0
588	2	Strathaven	2 0 0	8 0 0	3 0 0
643	2½	Thurso	2 10 0		2 10 0
		Tillicoultry			
		Turriff			
800	1	Tranent	1 0 0	5 0 0	1 0 0
		Troon			
		Tullibody			
2051	1	Wemyss & Buckhaven	1 0 0	6 0 0	1 0 0
		Wick			
665	5	Wigtown	5 0 0		
		IRELAND.			
1800	1	Antrim (Limited)	1 0 0		1 0
		Ardee			
300	10	Armagh (Lim.)	10 0 0	10 0 0	20 2 6
500	5	Athy (Limited)	4 0 0	6 0 0	5 0 0
		Balbriggan £1400			
		Ballycastle			
600	5	Ballymena	5 0 0	15 0 0	5 10 0
184	10	Bailymoney	10 0 0	5 0 0	10 0 0
220	5	Ballynahinch (Ld.)	5 0 0	5 0 0	5 0 0
		Ballyshannon £2000			
		Bangor, Down			
700	80	*Belfast*	80 0 0	10 0 0	100 0 0
	20	Do., new shares	20 0 0	10 0 0	25 0 0
1047	5	Carlow	5 0 0	5 0 0	5 0 0
600	5	Carrickfergus (Ld.)	5 0 0	8 0 0	6 5 0
197	10	Carrickmacross (L.)	10 0 0	5 0 0	10 0 0
300	10	Carrick-on-Suir	10 0 0	6 0 0	10 0 0
228	10	Castleblaney (Ld.)	10 0 0	5 0 0	10 0 0
400	5	Cavan (Limited)	5 0 0		5 0 0
		Clones (L.) £2000			
1300	5	Clonmel Consmrs.	5 0 0	5 0 0	5 0 0
240	5	Comber (Limited)	5 0 0	5 0 0	5 0 0
500	5	Cookstown	5 0 0	5 0 0	
		Coote Hill			
8000	5	Cork Conrs. (Lim.)	5 0 0	8 0 0	7 15 0
4000	5	Do., new shares	3 15 0	8 0 0	6 5 0
		Donaghadee £2000			
608	11	Drogheda	11 0 0	7 0 0	14 10 0
420	5½	Do., new shares	5 10 0	7 0 0	7 5 0
		Dublin Hibernian (*see* Untd. Gen.)			
19000	10	*Dublin Alliance*	8 0 0	7 10 0	11½ to 12
220	25	Dundalk (Limited)	25 0 0	8 0 0	28 0 0
		Dundrum (L.) £2500			
200	10	Dungannon	10 0 0	7 10 0	12 10 0
871	5	*Downpatrick*	5 0 0	4 0 0	4 0 0
249	10	Ennis (Limited)	10 0 0		11 0 0
240	25	Galway	25 0 0	10 0 0	35 0 0
		Gorey (L.) £2000			
		Holywood (Lim.)			
		Keady			
400	10	Kilkenny (Limited)	10 0 0	7 0 0	11 0 0
		Killarney (L.) £3000			
		Kilrush			
		Kinsale (L.) £2000			
210	10	Larne (Limited)	10 0 0	5 0 0	10 0 0
150	10	Letterkenny (Ld.)	10 0 0		12 10 0
		Limerick (*see* U.G.)			
500	10	Lisburn (Limited)	8 0 0	10 0 0	10 0 0
300	5	Lismore	5 0 0	3 0 0	
100	5	Do., preference	3 0 0	5 0 0	
600	15	Londonderry	15 0 0	6 13 4	21 0 0
		Longford			
520	10	Lurgan	7 0 0	6 0 0	7 0 0
		Mallow			
2191	1	Maryborough (Ld.)	0 5 0		0 5 0
		Midleton			
		Monaghan			
2000	10	Navan	5 0 0	6 0 0	4 0 0
		Nenagh			
1000	5	Newry Conrs. (L.)	5 0 0		7½ to 7¾
450	5	Newtownards	5 0 0	7 0 0	6 5 0
200	10	Newtownlimavady	10 0 0	5 0 0	10 0 0
		Omagh	5 0 0	7 10 0	6 0 0
500	5	Portadown	20 0 0	5 0 0	21 0 0
125	20	Portaferry			
		Queenstown	10 0 0	5 0 0	
		Roscommon £2500			
		Saintfield (L.) £1000			
500	10	Sligo	10 0 0	6 0 0	10 0 0
		Tuam (L.) £3000			
500	5	Tullamoore	5 0 0	3 10 0	5 0 0
240	5	Tullow	5 0 0		5 0 0
		Warrenpoint £3000			
1600	10	*Waterford*	10 0 0	6 0 0	12 0 0
300	10	Wicklow (Lim.)	10 0 0	6 0 0	10 0 0

The Gas-Works in the undermentioned towns belong to private individuals. Those marked * by the purchase of the shares in extinct companies:—

Aldershot. Alford. Barking*. Beaufort (Brecon). Beaumaris. Billericay. Blaydon, nr. Newcastle. Bodmin. Broadbottom. Bungay. Burntisland. Chapel-en-le-Frith. Chard. Clare, Suffolk. Crewe. Crickhowell. Dingwall. Eccleshill, nr. Leeds. Ellesmere. Ely. Enniscorthy. Falmouth. Farsley. Fermoy. Ferry Hill. Fleetwood. Goole. Hadleigh. Halstead. Harleston. Harrow-on-the-Hill. Hayle. Holbeach. Holt. Hunmanby. King's Langley. Knutsford. Leiston (Suffolk). Littleborough. Lynn. Market Deeping. Mold Green, nr. Huddersfield. Nantwich*. Nettlebed. Newport (I.W.). New Ross. Oakham*. Parsonstown. Penryn. Peterborough. Pontypool. Redditch. Rhyl. St. Ives* (Hunts). Seaham. Sidmouth. Sittingbourne. Southall, Midlsex. Spalding. Stokesley. Stowmarket. Thirsk. Tipperary. Tiverton*. Waltham Abbey. Wem. Wexford. Whitchurch (Salop). Whitby*. Willington Quay & Howdon.

The Gas-Works belong to Local Boards or to Municipal Corporations, or to Commissioners acting under special Acts of Parliament, in the following towns:—

Athlone. Ballinasloe. Bethesda, Bangor. Beverley. Birkenhead. Blackpool. Brighouse. Burnley. Burton-on-Trent. Bury (Lanc.). Carlisle. Cashel. Coleraine. Dalton. Darlington. Devizes. Doncaster. Enniskillen. Great Malvern. Greenock. Halifax. Haverfordwest. Keighley. Kells (Meath). Knaresborough. Layton with Warbrick (Lanc.) Leek. Limerick Corporation Works. Lytham (Lanc.). Macclesfield. Manchester. Middlesborough. Milton (Kent). Newton (Lanc.) Oldham. Paisley. Renfrew. Richmond (Yorkshire). Rochdale. Ross. Rothesay. Salford. Southport. Sowerby Bridge. Stockton-on-Tees. Stockport. Strabane. Teignmouth. Tenby. Tralee. Trim (Meath). Wallasey. Walsall. Wells (Norfolk) Workington. Youghall.

EQUITABLE GASLIGHT COMPANY.

NOTICE is hereby given that a HALF-YEARLY ORDINARY MEETING of the SHAREHOLDERS of this Company will be held at this Office on Tuesday, the 6th day of May next, to receive the Report of the Directors and Auditors, and to declare a DIVIDEND upon the Capital of the Company for the half year ending the 31st of December last.

The Chair will be taken at One o'clock precisely.

Notice is hereby also given that the Transfer Books of the Company will be closed on Friday, the 25th inst., and re-opened on Tuesday, the 6th of May next.

By order of the Board of Directors,
SAMUEL ANDREWS, Secretary.

Office, No. 21, John Street, Adelphi,
April 17, 1862.

GREAT CENTRAL GAS CONSUMERS COMPANY.

NOTICE is hereby given that the TWENTY-SECOND HALF-YEARLY ORDINARY MEETING of the SHAREHOLDERS of the above Company, will be held at the London Tavern, Bishopsgate Street, on FRIDAY, the 25th of April, inst., at Six o'clock in the evening, precisely, to receive the directors report, to declare a Dividend for the half year ending December 31, 1861, and to elect three directors, in place of those retiring by rotation, who being eligible for re-election, offer themselves accordingly.

R. M. MASSEY, Secretary.

The Books of the Company will be closed for the Transfer of Shares from the 16th of April to the 26th.

28, Coleman Street, London, April 8, 1862.

TO GAS COMPANIES.

WANTED, by an experienced Man,

a Situation, either at home or abroad, as MANAGER, Foreman, or Fitter. Has been used to every description of work, for the last twenty years, in the Erection of Works, and the Management of same. Can draw.

Address, M. J. D., Market Place, Wokingham, BERKS.

TO GAS COMPANIES.

ON SALE, by Private Treaty, at

the Gas-Works, St. Helen's, Lancashire, FOUR DRY-LIME PURIFIERS, with Hydraulic Valve, Connecting-Pipes, Grids, &c.

The Purifiers are 6 ft. by 6 ft. 2 in., with Four Tiers of Grids. The Hydraulic Valve has 8-inch Connexions all complete, with Grids for the Lime.

The whole of the above are equal to new, and are being removed for the purpose of enlarging.

Also, a STATION-METER, capable of passing 7000 cubic feet per hour, with Bye-Pass, Clock, and Tell-tale.

Reference can be made to Messrs. WEST and GREGSON, Meter Manufacturers, OLDHAM.

Apply to Mr. WILLIAM PRITCHARD, Gas Office, ST. HELEN'S.

February 18, 1862.

ANDERSON'S EXPERIMENTING LABORATORY AND GAS ENGINEERING OFFICES,

16, ADAM STREET, ADELPHI, W.C.
(Close to the Society of Arts.)

Mr. ANDERSON continues to Erect, or to supply the Drawings for his PATENT RETORT-SETTINGS. On this principle, three Ovens of Retorts are heated by one Coke and one Tar fire; and, for small Works, the principle is adapted to single Ovens in both cases, with a total absence of smoke, while the duration of the Retorts is from two to three years, and with great economy of fuel.

Mr. ANDERSON continues to supply his PATENT GAS-EXHAUSTER, together with Steam-Engines, &c., erected complete.

This is the most simple machine of the kind in use, being merely a double-action Pump, which any one can comprehend, and works for years without any repair.

Also, his PATENT FOUR-WAY VALVES. One of these valves does the work of three ordinary valves, when applied to Purifiers, Station-Meters, or other Gas Apparatus.

A workman cannot, by any possibility, make the mistake of shutting one passage without opening another; thus ensuring a constant flow of the gas.

All Racks, Pinions, Springs, and other delicate parts of ordinary valves, are in these valves abolished; the Connecting-pipes are also much simplified, and the cost reduced fully 30 per cent.

Also, his CONCENTRIC GOVERNOR, which stands in half the space of the ordinary Governor, and regulates the flow of Gas to the greatest nicety.

Mr. ANDERSON having five Gas-works on lease, besides being engineer to several others, has constant opportunities of perfecting his inventions before they are brought under public notice.

Mr. ANDERSON, in conjunction with Mr. STEVENS, of the Darlington Works, has recently erected and leased for a term of years, two Gas-Works of the Government, one at VICTORIA HOSPITAL, the other at the CAMP at ALDERSHOTT. At both places, the above designs are introduced, and cards to view may be had on application; as also, references to gentlemen who have used his apparatus for years.

Mr. ANDERSON may be consulted on all matters connected with the Manufacture of Gas, the Construction of new, or the reconstruction of old Works, Valuing the same, or obtaining parliamentary powers.

The Laboratory is being fitted up with apparatus for testing the chemical and photometrical properties of Coal-Gas, and also that of Meters, agreeably with the Act of Parliament. Gentlemen desirous of inquiring into such matters, are invited to pay a visit.

GEORGE BOWER,

GAS ENGINEER, MANUFACTURER, AND CONTRACTOR,

ST. NEOT'S, HUNTS.

References to between 100 and 200 Gas-Works Designed and Erected by the Advertiser.

TO INVENTORS AND PATENTEES.

MR. W. H. BENNETT, having had

considerable experience in matters connected with Gas, Water, and Sanitary Improvement, begs to say that he continues to assist Inventors in the perfection of their designs, and to obtain for them PROVISIONAL PROTECTION, whereby their invention may be secured for Six Months; or LETTERS PATENT, which are granted for Fourteen Years.

Patents completed, or proceeded with at any stage, thereby rendering it unnecessary for persons resident in the country to visit London.

Patents procured for Foreign Countries.

Information as to cost, &c., supplied gratuitously upon application to the advertiser, 42, Parliament Street, WESTMINSTER. [Office of the JOURNAL OF GAS LIGHTING, &c.]

GEFLE GAS COMPANY (Limited).

SEVEN PER CENT. GUARANTEED.

The Directors having leased the works of this Company to a responsible contractor, on terms which will enable them to pay a dividend of 7 per cent. clear of all deductions, are now PREPARED to RECEIVE APPLICATIONS for the REMAINING SHARES.

Forms of applications for shares may be had from the Brokers, Messrs. KERSHAW and BARNETT, 25, TOKENHOUSE YARD, E.C., of whom full particulars may be obtained.

THE GEFLE GAS COMPANY

(Limited). Capital £15,000, in 1500 Shares of £10 each, of which half have already been subscribed. £1 on application, and the balance on allotment.

BANKERS—The Union Bank.
BROKERS—Messrs. Kershaw and Barnett, 25, Tokenhouse, Yard, E.C.
SOLICITORS—Messrs. Davidson and Co.
SECRETARY—George Broom, Esq., jun.
OFFICES—Weavers' Hall, 22, Basinghall Street.

This Company was formed for the purpose of lighting the town of Gefle with gas, under a Concession obtained from the Municipal Corporation for thirty years, from the 18th day of December, 1860. The town is situate at the mouth of a river of the same name, on the Gulf of Bothnia, about eighty miles north of Stockholm, and has railway communication with the iron and copper mines, and also with the immense forests which cover the interior of Sweden. Its population is about 13,000. In point of Commerce and Shipping, it is one of the first towns in Sweden. Its manufactures are linen, sail-cloth, leather, tobacco, &c. Its exports are very considerable, and consist of deals, bar iron, tar, pitch, and copper; also salmon and river fish. To accommodate the largely increasing trade, extensive docks are in course of formation. It possesses an excellent harbour and ship-building yards.

The Gas-Works were commenced in the month of May last, and the town was lighted up on the 1st of December.

The terms of the Concession are as follow:—

The Concession conveys the sole right of lighting the town for the period of thirty years, from the 15th of September, 1861. The price to be paid for the gas by the Corporation for their lights is 6s. 9d. per 1000 cubic feet; and, by private consumers, 8s. 5d. per 1000 cubic feet. The town bind themselves to take a minimum amount of 1,500,000 cubic feet for street-lights. At the expiration of the thirty years, the Corporation is bound to buy in the works at their then value, or to renew the Concession, from time to time, for periods of ten years, until purchased by them.

The Directors have succeeded in leasing the works as from the 25th of March, at a rental which will enable them to pay their Shareholders 7 per cent., clear of any deduction whatever, and the lessee is bound to leave the works in good and substantial repair, and working order. The lease is for seven years, and the Directors confidently look forward to the expiration of that time to a consumption of gas which will enable them to pay a dividend of considerably higher amount.

It is to be observed, that while the price of Gas chargeable under this Concession is nearly double the English price, coals can be shipped from Newcastle to Gefle, at a cost of about 2s. per ton more than their price in London, and the Company are relieved of all import duty.

Full particulars as to the Concession and Lease, may be obtained either at the Offices, or from the Brokers.

The dividends are payable on the 25th of March, and the 24th of September, at the Union Bank.

The first dividend will be paid on the 24th of September next.

In order to discharge the advances made to the Company by private individuals to complete the works, the Directors are now prepared to issue the remaining Shares.

Applications for Shares to be made to the Secretary, or at the Bank, or to the Brokers, from whom full particulars can be obtained.

FORM OF APPLICATION FOR SHARES.

To the Directors of the Gefle Gas Company (Limited):

GENTLEMEN,—Having paid to your Bankers the sum of £—, being a deposit on Shares in the Gefle Gas Company (Limited), I hereby request that you will allot me Shares in the above Company, and I agree to accept such Shares, or any less number. And I further request that my name may be placed on the register of Shareholders for the Shares so allotted.

Name.....
Address.....
Profession.....
Date.....

BEARDMORE'S HYDRAULIC, AND OTHER TABLES.

The Publishers beg to announce that this work, having been long out of print, has been entirely re-arranged, and the original Tables have been merged into a Treatise, entitled

A MANUAL OF HYDROLOGY.,

This Book contains: DIVISION I.—Hydraulic and other Tables, with descriptive matter, and many new tables; the whole placed in a concise form.

DIVISION II.—On Rivers and Flow; on percolation of water; on wells and springs. On the flow in sewers, and water supply, with description of the floods of many considerable rivers, with other characteristics appertaining to their hydraulic conditions.

DIVISION III.—On Tides, Tidal Rivers, Estuaries; containing the strictest details of the conditions assumed by the tides under the varied states of the bore, and of those places where the tidal wave vanishes, also showing the effect of improvements in many of the tidal rivers of this country. Explained by tidal diagrams, sections of rivers, co-tidal lines, plates elucidating channel tides, &c., &c.

DIVISION IV.—On Rainfall and Evaporation; containing the best experiments on evaporation in various climates, tables of rainfall under every variety of elevation, period and locality. These Tables include all parts of the British Isles, France, Germany, Italy, Russia, North America, Australia, and India.

The work consists of 400 pages, and there are 20 large Plates.

Will be issued on the 14th of April, price £2. 2s.

WATERLOW and SONS, 49, Parliament Street, Westminster; 24, Birchin Lane, and London Wall, LONDON

THE BIRKENHEAD IMPROVEMENT COMMISSIONERS GAS and WATER COMMITTEE.

CONTRACTS FOR STORES.

The Commissioners are prepared to receive Tenders for the supply of the following articles for one year:—

No. 1. Wrought-Iron Tubing.
2. Brass and Copper Wire.
3. Lead Pipes.
4. Composition Pipe.
5. Tin Pipe.
6. Sheet Brass and Copper.
7. Block Tin.
8. Pig Lead.
9. Iron Fittings for Services.
10. Glass.
11. Sundry Oils and Turpentine.
12. White Lead and Putty.
13. Plaster of Paris.
14. Cotton Waste.
15. Soap, Candles, and Tallow.
16. Spun Yarn, Twine and Brushes.
17. Matches and Tapers.
18. Emery Cloth.
19. Brass and Copper Wire.
20. Sheet Iron.
21. Tin Sheets.
22. Zinc Sheets.

Samples of the above articles, with a statement showing the average yearly consumption of each, may be seen upon application to the undersigned at the Gas and Water Offices, 50, HAMILTON SQUARE, by whom further particulars will be furnished.

All goods supplied and not found equal to sample will be returned at the expense of the contractor.

Tenders addressed to the CHAIRMAN of the Gas and Water Committee, Birkenhead, must be sent in, on, or before the 1st day of May, with each article numbered to correspond with the number in the list.

The Commissioners do not bind themselves to accept the lowest or any Tender.

By order, JAMES H. ATHERTON,
Secretary and Treasurer.

STOURBRIDGE FIRE-CLAY WORKS.

E. BAKER and CO.

(Contractors to Government).

24 WHARF, HARROW ROAD, PADDINGTON, W.

Every article manufactured at their own Works and Mines, Brierley Hill.

FIRE-BRICKS, Lumps, Squares, Tiles, and Gas Retorts of all dimensions.

CRUCIBLE and CEMENT CLAYS.

GARDEN EDGINGS, of various patterns.

BUFF and ORNAMENTAL TILES.

CLINKERS and STABLE PAVINGS, noted for hardness and durability, being perfectly non-absorbent.

Shipments on the shortest notice.

GEORGE CUTLER & CO.,

GAS ENGINEERS, &c.,

London Gasholder and Boiler Works,

8, WHARF, WENLOCK ROAD, CITY ROAD, N., LONDON.

Rye, Nov. 12, 1860.

Dear Sirs,—I consider it incumbent on me to acquaint you that the alterations recently made on the Rye Gas-Works—viz., the addition of a NEWLY-IMPROVED WASHER, and other work for the Purification of Gas, executed by the experienced workmen under your able supervision—are perfectly satisfactory to the Company, and the Gas is now as pure as it can be made.

I am, dear Sirs, your obedient servant,
CHARLES THOMAS, Superintendent,
Rye Gas-Works.

Messrs. Cutler and Co.

GAS Stoves, Gas Baths, Gas Cooking APPARATUS, warranted the best in England at PHILLIPS's, the original inventor and manufacturer, and general gas-fitter, &c., 55, Skinner Street, Snow Hill, LONDON, E.C.

PATENT SAFETY ATLAS CHANDELIERS, Sun and Star Burners, Outside Lamps, Patent Reflecting Lamps, Portable Coppers for either Gas or Fuel. Iron Tube and Fittings. Best quality for Gas, Steam, or Hot Water, &c. &c.

JOHN ROGERSON and CO., NEWCASTLE-ON-TYNE & MIDDLESBRO'-ON-TEES.

Wrought and Cast Iron Pipes, Cast-Iron Retorts, and all kinds of Foundry Work necessary for Gas-Works. Fire-Bricks and Clay Retorts. Gas Coals of every description. Pig, Bar, and Plate Iron.

LONDON HOUSE:
12, ROYAL EXCHANGE BUILDINGS.

WM. RICHARDSON and CO., IRON ROOF, GASHOLDER, AND GAS APPARATUS MANUFACTURERS,
TUNNEL FOUNDRY, DUDLEY.

LESLIE'S PATENTS: Gas and Coke from common Coal, greatly increased in value.—60, Conduit Street, LONDON, W.

LESLIE'S PATENTS: Up to Forty Candle Gas.—60, Conduit Street, LONDON, W.

LESLIE'S PATENTS: Licenses for England, Scotland, and Ireland, the 86 Departments of France and Belgium.—60, Conduit Street, LONDON, W.

LESLIE'S PATENTS: The National Waste Heaps at Collieries UTILIZED for Gas purposes.—60, Conduit Street, LONDON, W.

SAMUEL CUTLER, Gasholder MAKER and CONTRACTOR

For Tanks, Roofs, Purifiers, Condensers, Erection and Alteration of Works and every description of GAS APPARATUS.

PROVIDENCE IRON WORKS,
MILL WALL, POPLAR, LONDON, E.

Main Laying and Gas-Works erected complete.

HARPER AND MOORE,
LOWER DELPH FIRE-CLAY AND BRICK WORKS,
STOURBRIDGE,
PROPRIETORS OF
BEST CLASS HOUSE-POT, & CRUCIBLE CLAY.
MANUFACTURERS OF
FIRE-CLAY GAS-RETORTS,
OF ALL DIMENSIONS.
LUMPS, TILES, BRICKS, &c.

Estimates given on application. Shipping Orders executed with despatch.

JAMES FERGUSON and CO., Lessees of the Auchinheath and Craignethan Gas Coal-fields (the most extensive and valuable in the parish of Lesmahago), respectfully intimate to the Managers of Gas-Works and Consumers of Gas Coal, that they are prepared to ship the best quality of the above well-known COALS at Glasgow or Leith; and also to deliver them at the railway stations upon, or connected with, the Caledonian Railway, to any extent which may be required.

Price, free on board, or delivered at the railway stations, may be learned by addressing James Ferguson and Co., Gas-Coal Works, Lesmahago.

Shipping Agent for Glasgow:
MR. ALEXANDER STRATTON,
159, WEST GEORGE STREET.

A. and C. MILLER, Agents for English and Welsh Gas, Steam, and House Coal Collieries. Ship, and Insurance Brokers. Gas Coals, 11s. 6d. in the Pool; drawback, 1s. per ton.

No. 9, George Yard, Lombard Street, and Coal Exchange, LONDON, E.C.

ALFRED PENNY, Gas and CONSULTING ENGINEER,
WENLOCK IRON WORKS,
21 & 22, WHARF ROAD, CITY ROAD, LONDON.

Mr. PENNY having had a large experience in the construction, alteration, and management of Gas-Works, begs to inform the Directors of Gas Companies that he may be consulted on all matters appertaining thereto. He also manufactures Gasholders, Purifiers, and all the various apparatus used in Gas-Works, and keeps in stock Retorts and Mouthpieces, Socket-Pipes, Bends, Branches, T-pieces, &c. &c.

Plans, Specifications, and Estimates prepared.

WALTER MABON, Engineer, ARDWICK IRON WORKS, FAIRFIELD STREET, MANCHESTER,
Manufacturer of
IRON TANKS for Gasholders, Railway Stations, &c.

GASHOLDERS.—Extensive premises at Gorton, solely for the manufacture of Gasholders, and other heavy Wrought-Iron Structures.

GAS APPARATUS.—W. M. has an extensive assortment of patterns for Purifiers from 4 feet to 15 feet square, also round ones from 4 feet to 10 feet diameter; Scrubbers, Condensers, Washers, Columns, Girders, and Tripod Patterns, suitable for Gasholders, from 10 feet to 150 feet diameter, either Single-lift or Telescope. Contracts for Gas-Works of any Magnitude. Designs, Specifications, and Estimates furnished.

WROUGHT and CAST IRON ROOFS for Railway Stations, Gas Works, Warehouses, and Sheds, prepared for Slates or for Corrugated Iron.

IRON HOUSES, either for Dwellings, Manufactories, or Public Buildings.

PIPES and VALVES, for Gas and Water, from 2 inches to 48 inches bore.

WILLIAM & BENJAMIN COWAN,

PATENT WET & DRY GAS-METER MANUFACTURERS,

Buccleuch Street Works, Edinburgh, & 13, Strutt Street, Manchester.

Established 1827.

SOLE MANUFACTURERS OF

ESSON'S PATENT COMPENSATING GAS-METERS;

KAY'S PATENT HYDRAULIC VALVE GAS-METERS;

Also, DRY METERS OF THE MOST APPROVED DESCRIPTION;

All of the above being Stamped under the Provisions of the SALE OF GAS ACT.

W. and B. C. are likewise prepared to supply ESSON'S PATENT COMPENSATING FOUNTAINS, and KAY'S PATENT HYDRAULIC VALVES, now so extensively used for bringing existing Meters within the requirements of the Act of Parliament.

GOVERNORS, STATION-METERS, PRESSURE-REGISTERS & GAUGES,
MINUTE-CLOCKS, EXPERIMENTAL METERS, &c.

COCKEY'S PATENT GAS-VALVES.

These Valves are formed of two Cast-Iron Cylinders, with segmental divisions, having the faces ground gas-tight—the upper Cylinder turning horizontally on the lower one.

The lower Cylinder has pipes from each division, communicating with the vessels to and from which the gas is to be passed. The upper Cylinder has corresponding divisions, so arranged as to direct the passage of gas to the different segmental divisions in the lower part, and, when it is turned on the face of the lower one, to alter the flow of gas from one vessel to another.

These Valves are adapted either for bye-passes for connecting two, three, and four purifiers, or for the inlets of several Gasholders, and are in use for these purposes at the following Works:—

ALTON, HANTS.	CLEVEDON.	FROME.	NEWPORT, MONMOUTH.
BRIGHTON.	CHELTENHAM.	GODALMING.	REDRUTH.
BASINGSTOKE.	CHATTERIS.	HESSLE.	RYDE, ISLE OF WIGHT.
BLANDFORD.	EASTBOURNE.	LANGPORT.	SALISBURY.
BARKING.	ELGIN.	MALVERN.	WARMINSTER.
CANTERBURY.	ENNISCORTHY.		

Besides many small private Gas-Works.

There are Two specimens at the International Exhibition in Class 10; one of them represents the Valve with its Index-Plate fixed for regulation, and the other shows the Valve open, exposing its passages.

IRON WORKS, FROME SELWOOD.

WILLIAM RICHARDS,

PATENT DRY AND WET GAS-METER MANUFACTURER,

CRAWFORD PASSAGE, COPPICE ROW, CLERKENWELL, LONDON.

William Richards, Sole Inventor, Co-patentee, and original Manufacturer of the Dry Meter, generally known as Croll's or Glover's, and which obtained Prize Medals at the Universal Exhibition, 1851, the New York Exhibition, 1853, and the Paris Exhibition, 1855, intimates to Gas Companies, Engineers, and the Trade generally, that he has established a Manufactory at the above address for his Dry Meters; and, in soliciting the patronage of those engaged in Gas Lighting, the Advertiser can assure them that the Instruments manufactured by him are not to be surpassed. They are capable of indicating accurately the smallest possible quantity. Their flexible material is of a superior quality, which Fifteen years experience has demonstrated to excel all others for durability; and all the metals of the working parts are incorrodible.

W. R. invites the attention of those preferring the Wet Meter to his patented improvements therein, which consist in contracting the Chambers of the Measuring-Wheel, at and near the Water-Line, thus allowing of a longer range for the Float, and avoiding the sudden extinctions so common; also a simple remedy is applied to prevent the fraudulent consumption of Gas, which the operation of the recent Sales of Gas Act has so much facilitated.

The workmanship and materials are such as to leave nothing to desire.

A TRIAL ORDER IS SOLICITED.

Manufacturer of the

TELL-TALE EXHAUST AND PRESSURE-INDICATOR;

An indispensable Instrument to the perfect working of the Exhauster.

GOVERNORS, STATION-METERS, DRY METERS FOR PUBLIC LAMPS, &c.

LLOYD AND LLOYD

ALBION TUBE-WORKS, BIRMINGHAM,

MANUFACTURERS OF

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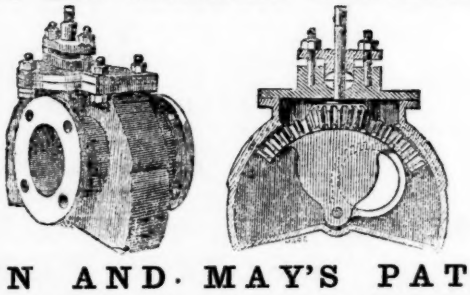

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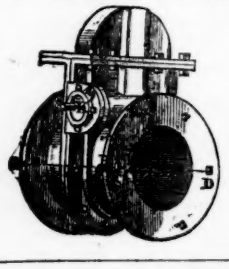

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